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STORED GRAIN.

Some Insects which Prey Upon It and Cause Great Loss.

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Stored grain is subject to injury by insects of several kinds, popularly termed "weevils." Upward of two score of species occur commonly in granaries, three living throughout their adolescent stages within the kernel of the grain. These three are the granary weevil, rice weevil, and Angoumois grain moth, the most injurious forms, both at home and abroad. The remaining species live on grain in the kernel, also when manufactured into flour and meal, and feed as well on various other edible products; hence, though of comparatively little importance as the authors of primary injury to the seed, they are very frequently the cause of serious damage to manufactured products and to grain that has suffered first from the attacks of the weevils or grain moth and has been kept for a length of time in store.

Nearly all of the grain-feeding species known in the United States have been introduced and are now cosmopolitan, having been distributed by commerce to all quarters of the earth, no insects being more easily carried from one land to another, since they breed continuously for years in the same grain and are unknowingly transported when in an immature state in the kernels. Most of our indoor insects are indigenous to the Tropics and do not thrive in the cold climate of our extreme northern States, but in the South they have become acclimated and there do their greatest damage.

NATURE AND EXTENT OF DAMAGE.
Aside from the loss in weight occasioned by the ravages of insects, grain infested by them is unfit for human consumption, and has been known to cause serious illness. Nor is such grain desirable for food for live-stock or for seed, its use in the latter capacity being apt to be followed by a diminution in the yield of a crop.

Of the insect injury to stored grain it has been estimated of Texas alone that there is an annual loss of over a million dollars, and that nearly 50 per cent. of the corn of that State is annually destroyed by weevils and rats. The loss from granary insects to the corn crop in Alabama in 1893 was estimated at \$1,671,382, or about 10 per cent.

There are seven other States subject to the same atmospheric and other influences as Alabama and producing in the aggregate a somewhat larger average yield of corn. Estimating the annual loss in the same proportions, we would have for these eight Southern States, viz., South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Texas, and Arkansas, a total of nearly \$20,000,000. This is for corn alone, and does not take into consideration wheat and other grains or mill products.

In regard to the susceptibility of different grains to "weevil" attack, it may be said that unhusked rice, oats, and buckwheat are practically exempt, but the hull of barley offers less protection to the seed. Husked or hulled grains are naturally more exposed to infestation, and the softer varieties suffer far more injury than do the harder, flinty sorts.

In times when grain was kept long in store, and long voyages were necessary in its transportation, losses through the depredations of insects were much heavier than at present, these pests being exceedingly prolific and increasing enormously under such conditions. Heat and dampness, the latter inducing a condition of the grain termed "heating," also favor the undue increase of insect life, and the insects, when present in large numbers, cause, in some unexplained manner, a very perceptible rise in temperature to the infested mass. It is unnecessary to add that dampness and "heating" alone do not of themselves engender "weevil," every individual insect owing its existence to an egg deposited in the grain by the parent insect.

THE GRAIN WEEVILS.
All the various species of insects that attack grain are indiscriminately called weevils, or simply "weevil," but the only true grain weevils are the granary weevil and rice weevil.

These two insects resemble each other in structure as well as in habit. They are small, flattened, brown snout-beetles of the family Calandridae. Neither is more than a sixth of an inch in length, but their rate of development is so rapid that they do an almost incalculable amount of injury in a short period of time. Their heads are prolonged into a long snout or proboscis, at the end of

which are the mandibles; their antennae are elongated and are attached to the proboscis.

THE GRANARY WEEVIL (*Calandra granaria* Linn.)

The granary weevil has been known as an enemy to stored grain since the earliest times. Having become domesticated ages ago, it has long since lost the use of its wings and is strictly an indoor species.

The mature weevil measures from an eighth to a sixth of an inch, is uniform shining chestnut-brown in color, and has the thorax sparsely and longitudinally punctured, as indicated, much enlarged, at fig. 1, a.

The larva is legless, considerably shorter than the adult, white in color, very robust, fleshy, and of the form shown in the illustration (b). The pupa, illustrated at c, is also white, clear, and transparent, exhibiting the general character of the future beetle.

The female punctures the grain with her snout and then inserts an egg, from which is hatched a larva that devours the mealy interior and undergoes its transformations within the hull. In wheat and other small cereals a single larva inhabits a grain, but a kernel of maize furnishes food for several individuals.

The time required for the completion of the life cycle varies with the season and climate, and the number of generations annually produced is consequently dependent upon temperature. The Midsummer period from egg to adult is about six weeks, and there may be, under favoring conditions, four or five broods in this latitude and six or even more in the South.

This species is injurious in wheat, maize, barley, and other grains and attacks also the chick-pea (*Cicer arietinum*), a food product of the Tropics. Unlike the moths which attack grain, the adult weevils feed also upon the kernels, gnawing into them for food and for shelter, and being quite long-lived, probably do even more damage than their larvae. This species is very pro-

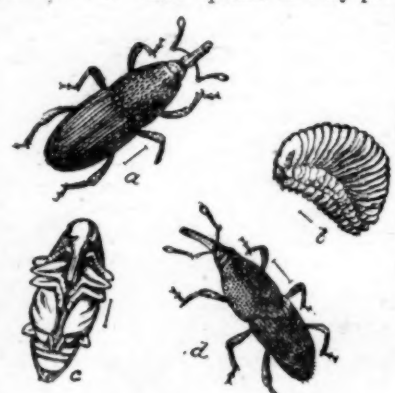


FIG. 1.—*Calandra granaria*: a, beetle; b, larva; c, pupa; d, c. oryza, beetle—all enlarged (author's illustration).

life, egg-laying continuing over an extended period. It has been estimated that one pair will, in the course of a year, produce 6,000 descendants, and it will be seen that the progeny of a single pair are capable in a short time of causing considerable damage.

THE RICE WEEVIL (*Calandra oryza* Linn.)

A very similar insect to the preceding is the rice weevil, which derives both its popular and Latin name from rice (*oryza*), in which it was originally discovered. It is conceded to have originated in India, whence it has been diffused by commerce until it is now established in most of the grain-growing countries of the world. It is a serious pest in the Southern States, where it is commonly, though erroneously, called "black weevil," but farther north is of less importance. It occurs, however, in every State and Territory in the Union, and occasionally invades Canada and Alaska.

This species resembles the granary weevil in size and general appearance, but differs in being dull brown in color, in having the thorax densely pitted with round punctures, and the elytra, or wing cases, ornamented with four more or less distinct red spots, arranged as in the illustration (fig. 1, d). Unlike the preceding species it has well-developed and serviceable wings. The larva and pupa are also similar to those of the granary weevil, and in habits and life history these two species do not materially differ, except in that the rice weevil may often be found in the field remote from the granary, and in the extreme south and in the Tropics lays its eggs in standing grain.

The rice weevil feeds upon the grain of rice, wheat, particularly the soft varieties, maize, barley, rye, hulled oats, buckwheat, chick-peas, and the cultivated varieties of sorghum known as Kafir, or Jerusalem corn, etc., and the adult beetles, when abundant in store-houses and groceries, invade boxes of crackers, cakes, and other breadstuffs, barrels of flour and bags of meal.

THE ANGOUMOIS GRAIN MOTH (*Sitotroga cerealella* Ol.)

This moth received its name from the province of Angoumois, France, where it is known to have been injurious since the year 1736. In this country, where it is familiarly but incorrectly called "fly weevil," it is said to have been recognized as early as 1728. From the seat of its supposed introduction, in North Carolina and Virginia, this moth has spread to neighboring States in the South, where it does incalculable damage, and to the southern portions of the

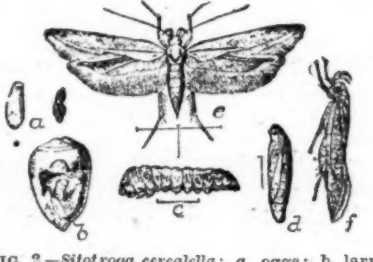


FIG. 2.—*Sitotroga cerealella*: a, eggs; b, larva at work; c, larva, side view; d, pupa; e, moth; f, same, side view (original).

Northern States, where it is less injurious. Although not so widely distributed as the true grain weevils, it is rapidly increasing its range, and as it attacks grain in the field, even as far north as central Pennsylvania, as well as in the bin, it is even a more serious pest in the localities in which it has become established than the weevils. It infests all the cereals, as well as buckwheat and the chick-pea, product of the Tropics. It has been estimated that in six months grain infested by this moth loses 40 per cent. in weight and 75 per cent. of its nutritive matter.

The adult insect resembles somewhat a clothes moth, for which indeed it is often mistaken. It is light grayish brown in color, more or less lined and spotted with black, and measures across the expanded fore-wings about half an inch (see fig. 2). The hind-wings are bordered with a long, delicate fringe.

The moth deposits its eggs in standing grain and in the bin, singly and in clusters of from 20 to 30. The eggs shown, much enlarged, in the illustration, are white when first laid, but soon turn red and hatch in from four to seven or more days, when the minute larva or caterpillars burrow into the kernels and feed on the starchy interior. A single larva inhabits a grain of the smaller cereals, but maize affords sustenance for two or more individuals. A kernel of corn opened to show the larva at work is reproduced at fig. 2, b, and an ear of infested popcorn is shown at fig. 3.

In three weeks or more, according to season, the caterpillar attains maturity, when it spins within the kernel a thin, silken cocoon and transforms to a pupa or chrysalis, the moth emerging a few days later, the entire period from egg to adult embracing in summertime about five weeks and in colder weather considerably longer. After copulation the moth deposits eggs for another brood, and thus several generations are produced in the course of a year. The older writers state that the species is double-brooded, but as it breeds continuously in harvested grain, there is now, as in the case of most indoor insects, an irregular development, influenced by temperature. In the latitude of the District of Columbia, in an outdoor exposure, such as is afforded by an old-fashioned corncrib, there are probably not more than four broods, the insect hibernating as larva in the grain, but in a heated atmosphere we have the possibility of five or six generations annually. In the warmer climate of the South, where the insect can breed un-

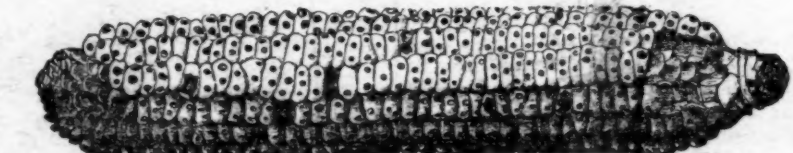


FIG. 3.—Ear of popcorn showing work of Angoumois grain moth (from Riley in Ann. Rept. Dept. Agr., 1884).

interruptedly throughout the winter, it has been estimated that as many as eight generations may be produced.

THE WOLF MOTH (*Tinea granella* Linn.)

The wolf, or little grain moth, does considerable injury to stored cereals in Europe, but as it is not particularly destructive in America, requires only passing mention. This species is of about the size of the Angoumois moth, creamy white in color, thickly mottled with brown. Like the latter, it is known to oviposit in grain in the field. It infests cereals of all sorts, and a single caterpillar is capable of great damage, as it has a habit of passing from one grain to another, spinning them together with its webs as it goes, until 20 or 30 grains are spoiled. When full grown the caterpillar crawls all about the infested mass, leaving their webs everywhere, thus injuring more than they consume.

PREVENTIVE MEASURES.

A limited number of insects, like the Angoumois grain moth in the extreme South, enter the grain in the field, and certain precautions are therefore necessary to prevent their access to the granary. This is accomplished, first, by harvesting as soon as the grain is ripe; second, by thrashing as soon afterwards as possible.

In the process of thrashing or cleaning much infested grain is blown out with the chaff and dust, and the moths and many adult weevils are killed by the agitation which the grain receives; but the immature forms of these insects, concealed in the kernels as eggs, larvae, and pupae, are apt to survive this treatment, and further measures are necessary for their destruction.

For this purpose a quarantine bin is desirable, to be as nearly airtight as possible, in which the newly thrashed as well as the infested or suspected grain can be fumigated with bisulphide of carbon.

Fresh grain should not be exposed to insect attack by being placed in bins with "weeviled" grain, or even housed under the same roof with such grain. If before storing in buildings that have been infested, the old grain be removed, the bins thoroughly cleaned, floors, walls, and ceilings brushed and scrubbed, the chances of infestation will be reduced to a minimum. If the storehouse has been badly infested, a fumigation of bisulphide is necessary.

In times when the Angoumois grain moth was so injurious in France a number of machines were devised for the treatment of infested grain. Into these the grain is poured and revolved while exposed to heat or subjected to a violent agitation which kills the contained insects.

Cleanliness will accomplish much toward the prevention of injury from warehouse pests, the cause of a great proportion of injury in granaries, mills, elevators, and other structures where grain and feed are stored being directly traceable to a disregard of neatness. Dust, dirt, rubbish, and refuse material containing sweepings of grain, flour, and meal are too frequently permitted to accumulate and serve as breeding places for a multitude of injurious insects.

The floors of the storehouse should be frequently swept, and all material that has no commercial value burned. A certain amount of attention has always been given to the construction of the storehouse with a view to the exclusion of insects, and, with the advent of the flour moth, our modern mills are being fitted with reference to its peculiar habits.

The ideal farmer's granary, from the standpoint of insect ravages, should be built at some distance from other buildings and the rooms constructed so as to be as near vermin proof as possible. The doors should fit tightly, and the windows covered with frames of wire gauze to prevent the passage of insects. The floor, walls, and ceilings should be smooth, so as not to afford any lurking places for the insects, and it would be well to have them oiled, painted, or white-washed for further security. A coating of coal tar has been strongly recommended for the latter purpose. Such measures are not an absolute necessity in cold and temperate climates, but in the more heated atmosphere of our Southern States whatever possible should be done to lessen the chances of damage.

The value of a cool place as a repository of grain has been known of old, and a building in which any artificial heat is employed is undesirable for grain storage. The "heating" and fermentation of grain, as is well known, is a productive source of "weevil" and this

should be prevented by avoiding moisture and by ventilation. The storage of grain in large bulk is to be commended, as the surface layers only are exposed to infestation. This practice is particularly valuable against the moths, which do not penetrate far beneath the surface. Frequent agitation of the grain is also destructive to the moths, as they are unable to extricate themselves from a large mass, and perish in the attempt. The rice and granary weevils, however, penetrate more deeply, and, although bulking is of value against them, it is not advisable to stir the grain, as it merely distributes them more thoroughly through the mass.

Many remedies have been proposed for use against stored-grain insects, mostly of impractical or doubtful utility, and a long list of such substances, which are chiefly of a supposed repellant nature, could be given. The few of these

which might be of value must be used in large quantity and in tight receptacles to be effective.

The most effective deterrent is naphthalene, which when used in tight receptacles is an almost perfect preservative of seed stock and other products subject to insect attack. Its use is not, however, desirable with material that is to be used as food, on account of its powerful and permanent odor. Salt, air-slacked lime, and powdered sulphur also serve the same purpose, but their use is also objectionable for different reasons.

THE BISULPHIDE OF CARBON TREATMENT.

The simplest, most effective, and inexpensive remedy for all insects that affect stored cereal and other products is the bisulphide of carbon, a colorless liquid with a strong, disagreeable odor, which, however, soon passes away. It vaporizes abundantly at ordinary temperatures, is highly inflammable, and is a powerful poison.

It may be applied directly to infested grain or seed without injury to its edible or germinative principles by spraying or pouring, but the most effective manner of its application in moderately tight bins or other receptacles consists in evaporating the liquid in shallow dishes or pans or on bits of cloth or cotton waste distributed about on the surface of the infested material.

A Farm-Mortgage Company.

EDITOR AMERICAN FARMER: Allow me to draw your attention to the report of the Commercial Agent of the United States in Planen, Germany—Mr. Thomas Willing Peters—of the 15th of April inst. This gentleman openly concurs with my views in regard to mortgage companies. Allow me further to advise you that after many negotiations I have at last succeeded in establishing a mortgage company without the immediate help of American financiers, and that I am going to Germany to have the company incorporated there and to get the necessary funds. The company here will take the form of a mutual association after the style of the Ritterschaftliche Privatbank in Prussia, and will be incorporated as soon as I shall have secured 100 members.—Dr. EMIL DORR, 341 E. 15th St., New York.

Capacity of a Soil for Water.

Concerning the capacity of soil for water, the conclusions of Wollny are as follows: (1) A compact soil loses more water by evaporation than a loose one, because the capillary spaces are smaller in diameter and more easily conduct to the surface the water in the deeper layers. On this account the surface of a compact soil remains moist longer than a loose one. (2) A compact soil has a greater capacity for water than a loose one, although it is less permeable. The capillary spaces are smaller, the number of water pores are increased, and the penetration of water into the sub-soil is hindered. (3) A compact soil offers more water for the plant than a loose one. When it is desired to increase the capacity of a soil for water it must be made more compact.

The susceptibility of soil to drought is represented by the proportion between the water lost by evaporation and the maximum weight of water it is able to hold. Schloßing has pointed out the important facts that the size of the soil particles and the degree of humidity exert an influence on the amount of water transported toward the surface. The fineness of the superficial layer also modifies evaporation.

Cultivation and Evaporation.

Prof. King, of the Wisconsin Station, says that, after a rain, soil to a depth of a meter and a half contains about 6,000 tons of water per hectare, the greater part of which is carried off by evaporation. Cultivation is very efficacious in preserving this water. Prof. King determined on April 28 the quantity of water contained in two contiguous soils, afterwards plowing one of them. Seven days later the water content was examined to a depth of 1.2 meters. The plowed soil had lost from the upper 30 cm. 11.5 tons per hectare, and there was a gain of the same quantity of water for the succeeding 90 cm. The unplowed soil, on the contrary, to a depth of 1.2 meters, had lost 495 tons of water. Spring plowing, therefore, conserves the humidity necessary for plants, but although this plowing is very efficient, harrowing and scraping poorly done is not. Harrowing which simply scratches or furrows the surface without covering it completely with loose soil increases evaporation rather than reduces it. On the contrary, a layer of dry soil 2 cm. deep greatly reduces evaporation.

Fifteen thousand cattle and 20,000 hogs are fattening on a 30,000-acre farm in Atchison, Mo.

CRIMSON CLOVER.

Experiments to Study the Influence of Time of Seeding.

(Report of the New Jersey Experiment Station.)

These experiments were carried out upon the College Farm, and upon the farm of Thos. J. Beans, of Moorestown. The character of the soil upon these

protection to keep alive a rather thin stand of plants, but these have so developed that they make quite a demonstration, so tall and many-stalked are they. (See cut No. 1.)

"The next was sown Aug. 4, on ground plowed, turning under pea vines after peas had been picked off, and seed was harrowed in with 'Thomas' Timothy Harrow.' The specimen sent is an average one from the coarsest sand. (See cut No. 2.) Where the land descends to where there is some loam the plants



two farms are radically different, that of the College Farm being a rather heavy clay loam, whilst that of Mr. Beans ranges from a coarse sand to a sandy loam. The weather during the Fall of 1894 was dry and hot, and not favorable either for a good catch or for rapid growth.

On the College Farm the dates of seeding were Aug. 4 for No. I, Aug. 13

are larger, and very badly lodged, as is somewhat on every the coarsest sand. It makes such a display that it attracts much attention, and is on soil on which we have never succeeded in raising red clover during 30 years, though we have never tried it there with a Summer sowing.

"The next was sown on Aug. 13, among late potatoes, followed by a har-



for No. II, and Aug. 29 for No. III, and Oct. 1. Representative specimens of the plants from the first seedings, the seeding of Oct. 1 being a failure, were taken April 24, and are shown in the accompanying cuts. The plants represented by Nos. I and III were seeded on raw ground after a heavy crop of fodder corn had been removed, and No. II, on adjoining land from which no crop was harvested.

Specimens were taken by Mr. Beans on May 23, and are shown in the accompanying cuts. Mr. Beans' report is appended:

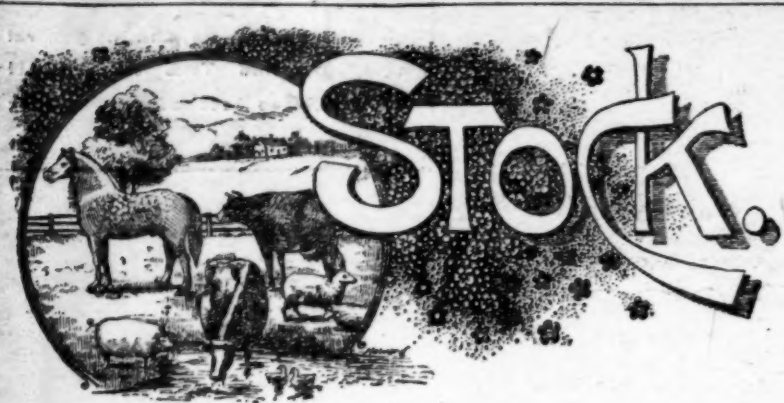
"The first sown was covered by an 'Acme Harrow' on July 11, at last dressing of watermelons—rows 10 feet apart, about half their length sandy and half with some loam. During some hot days, soon after the plants started, they were all destroyed. The same result followed sowing early in July a previous year during some hot days. We have had the thermometer to indicate in the sand a temperature of 127° F. to 140° F. at midday, with bright sunshine.

"The next sowing was on July 21, among late citrons at last dressing, and among tomatoes alongside. There was a good catch, but subsequent sunburning destroyed the plants among the tomatoes, but the citron vines gave a good

row between the rows, and was alongside the previous sowing. The catch was satisfactory; the growth so vigorous that it was with difficulty we plowed it



under the 15th of May, and over it to-day (May 23) we planted sweet potatoes, the ground being in splendid condition. The specimen sent (see cut No. 3) was disturbed in riding up, and I (Continued on second page.)



The Cornstalk Disease.

Prof. V. A. Moore, of the Bureau of Animal Industry, has been making exhaustive investigation of the so-called "cornstalk disease."

The affection is restricted in distribution to the middle and northern portion of the Mississippi Valley, where the farmers harvest their corn by picking the ears from the standing stalks, cattle then being turned into the fields. Owing to the insidiousness of the disease and the frequent failure of veterinarians and butchers to find lesions sufficient to cause death, the disease has been regarded as a most mysterious affliction and almost invariably fatal. The disease has been known to exist for 40 years. Various theories as to its cause have been suggested—lack of salt and insufficient water, eating cornstalks alone, stomach impaction, ingestion of corn-smut, and the presence of the species of bacteria which causes corn-blight, or Burrill disease. The first three theories are of popular origin and not supported by the general experience of cattle raisers.

It is believed that the disease is due to the existence of a poison in the cornstalks, although the nature of this toxin has not yet been determined, and its presence is indeed but a provisional hypothesis based upon the trend of the accumulated data. It is stated that although the loss of cattle from this disease is severe, it is not of such great economic importance as has been thought, and as it is not contagious, does not threaten the cattle industry of this or other countries to which cattle may be shipped.

Prevention is regarded as the only practical remedy. It is recommended that cornstalks and leaves for fodder be cut, and fed to cattle after this manner, instead of the cattle being turned into the fields and allowed to feed upon the standing stalks.

Feeding for Beef.

Bulletin 39 of the Mississippi Station gives some results of feeding for beef which are of great interest. Four kinds of hay were used, shredded corn fodder, crabgrass, peavine, and red clover. The red clover was the one upon which the best gains were made, and this was followed very closely by the peavine, while the shredded corn was the poorest feed in the lot, although this was made up, in part at least, by its small cost. For a grain feed, five and a half pounds of cottonseed-meal per day gave the best results, giving a better gain than did seven and a half pounds. "Jack Bean" meal was of almost no value, as it was not relished by the cattle, and even after they were taught to eat it the gains were very small.

Copies of the bulletin can be had, free, by writing to the Director of the Station, S. M. Tracy, Agricultural College, Miss.

Measuring Cattle for Weight.

There is no exact method of estimating the weight of cattle by measurement, but an approximation may be made in this way. The rule is used by English graziers: Take the length in inches from the top of the shoulders to the root of the tail. Square the girth in inches, that is, multiply the number of inches by itself and multiply this by the inches in the length. Divide the sum by 7,250 and multiply the divided by 14. This gives the weight in pounds. If not divided by 14 the weight is given in "stones," a common weight used by English cattlemen. Thus, if an ox is 6 feet in length and 7 in girth, 60 by 7, 7,056 (the square of 84) is 423,360, divide by 7,250 leaves 58 and 14, gives 812. This estimate may be exact for a square-bodied, fat animal, but it is impossible to give any rule for measuring thin, bony, lanky beasts.

Over 500 Cattle Condemned.

According to the New Hampshire State Cattle Commissioner's report for 1895 and 1896, transmitted to the Governor and Council, 517 herds were inspected and 562 cattle condemned and destroyed. The post-mortem examination made on each of the condemned animals verified the diagnosis of tuberculosis in 559 cases, and as no microscopic test was made in either of the remaining cases the disease probably existed in these also.

Over half the herds inspected were in Hillsboro County, and of the animals there examined 333 were destroyed.

Tuberculosis in Maine.

The Legislative Committee on Agriculture of Maine is to give the subject of tuberculosis a thorough examination. It intends to know if there is any truth in the reports of the increase of the disease. Senator Roberts, of Oxford, has introduced an order authorizing the Committee to take under consideration the matter of bovine tuberculosis, the cause and conditions which develop it, to what extent it is brought into the State from other States and countries, whether it is on the increase or decrease in this State, and whether there is reason for changes in the laws for the suppression of the disease. Senator Roberts says there is a feeling that the disease has been exaggerated by men who have been interested in making tests of cattle, and that the public has been deceived in regard to the prevalence of and danger from tuberculosis in Maine.

COMPULSORY TESTING OF HERDS.

Biddeford and Saco Health Boards Join Issues in Effort to Stamp Out Tuberculosis.

The Biddeford and Saco (Me.) Boards of Health have been in consultation to decide upon a method of procedure to stamp out tuberculosis in that vicinity. They have finally agreed that the City Solicitor in each city be asked to draft an ordinance, to be presented to the City Governments for action, to compel every milkman to have his cows tested, and also forbidden to dispose of his milk here unless able to show to his customers a clean bill.

Many of the farmers and milkmen in this vicinity have already had their herds tested, and in several instances cases of tuberculosis have been found and the diseased cattle killed. There are, however, a few owners of cows who regard the present agitation as an unnecessary scare, and they are opposed to subjecting their cattle to the test. It is to reach this class that the local health boards have been joining issues.

Ayrshire Breeders.

The 22d annual meeting of the Ayrshire Breeders' Association was held in the parlor of Stanwix Hall, Albany, N. Y., Jan. 21, 1897.

The election of officers resulted as follows: Pres., L. S. Drew, Burlington, Vt.; V-Ps., Obadiah Brown, Providence, R. I.; H. R. C. Watson, Brandon, Vt.; B. C. Sears, Blooming Grove, N. Y.; John Stewart, Elburn, Ill.; Sec., C. M. Winslow, Brandon, Vt.; Treas., Henry E. Smith, Enfield, R. I.; Executive Committee, for three years, J. D. W. French, No. Andover, Mass.; John Bratton, White Oak, S. C.

The result of the Home Dairy test for 1896 showed two entries, as follows: Geo. H. Yeaton, Dover, N. H., 10 cows, tested two days in June and two days in December, by an agent from the N. H. Experiment Station, gave 1,256 pounds of milk, 4.13 per cent. butter fat, 13.17 per cent. total solids, 58.88 pounds butter fat. The food in June being pasture by day, with one feed of hay, three quarts of bran, two quarts gluten feed and two quarts cottonseed meal daily. In December, two feeds of ensilage, two feeds of hay, with five quarts bran, three quarts gluten feed and two quarts cottonseed meal daily.

C. M. Winslow, Brandon, Vt., 10 cows, tested by an agent from the Experiment Station, Burlington, Vt., gave 1,047 pounds milk, 4.12 per cent. butter fat, 12.89 per cent. total solids, 72.03 pounds butter fat. The food in June being pasture with four quarts bran daily. In December, hay, with six quarts bran, one-half quart gluten meal, one-half quart cottonseed meal, one-half quart oil meal daily.

The Cow in Iowa.

Hurrah for the Iowa cow! She is one of the greatest sources of wealth the State affords, and is doing her work quietly, faithfully, and well. During the past year she produced wealth to the value of \$42,000,000, which is more than all the silver mines in the country did. And yet we hear a great deal about silver and little about the cow.—*Dubuque Herald.*

The tuberculosis law has been suspended in Connecticut.

Frozen Meat from Australia.

The importation of frozen meat principally from Australia has increased enormously since the establishment of refrigerating warehouses at Havre, reports Consul Chancellor, at that port, to the State Department, the product arriving in perfect condition after a sea voyage of three or four months.

Such meat, however, decomposes rapidly on exposure to the natural air, and as many butchers label it as fresh meat, the French Minister of Agriculture has under consideration a law compelling all such frozen meats to be conspicuously labeled and providing a fine of from \$100 to \$200, with imprisonment, for an evasion or violation, the punishment to be double for a second offense.

Fleas.

The flea causing most common annoyance is *Pulex serraticipes*, infesting the dog and cat. In case of an outbreak of fleas in the house freely sprinkling pyrethrum powder about the rooms, followed by spraying the carpets and floors with benzol, and as a last resort washing the floors with hot soapsuds are recommended as efficient remedies.

Warm Hood's Sarsaparilla

The best—in fact the One True Blood Purifier. Hood's Pills are the best abdominal pills, aid digestion, etc.

SHEEP AND WOOL.

Shearings.

At last the Southern farmers are discovering that sheep are invaluable weed-killers.

It has been estimated that 1,250,000 pounds of wool was clipped from the 250,000 sheep in Alabama last year.

There is no reason to object to silage as a food for sheep, if it is not sour, and is not fed altogether. A succulent food of some kind is indispensable for the flock, and if roots are not obtainable we would advise using silage, providing it is well kept. As a rule, sour or moldy food is quite unfit for a flock. As a good crop of beets may be grown about as easily as corn, and may be kept in a cellar safely all Winter, the roots, we think, the better of the two, as wholly free from risks of any kind.

Southdown sheep breeders in the United States and Canada will be pleased to learn that the Southdown breeders in England that have heretofore had two organizations, the "Southdown Sheep Breeders' Association" and the "Southdown Club," have united into one Association, the Southdown Sheep Society. The new society will doubtless have the hearty support of the American Southdown Association, and importers of sheep from England, will have little difficulty in recording their importations.

KAFIR CORN FOR SHEEP.

Prof. Thos. Shaw Discusses It as a Summer Food.

Kafir corn is pre-eminently a child of the sun. It seems to be at its best in the latitudes of Kansas and Oklahoma. There it is considered superior to corn for fodder, first in its ability to resist the influence of drouth, second in the quantity of food that it furnishes, and third in the greater greenness of the foliage late in the season, which has a favorable influence on palatability. It may be accepted as a foregone conclusion that if Kafir corn is at its best in the latitudes named it will not be at its best in those much farther to the north. We find accordingly that in Ontario, Canada, Kafir corn does not make a growth sufficiently vigorous to justify growing it as a field crop, and this would imply that north of the line from St. Paul to Pittsburgh very much should not be looked for from the growth of this plant.

WARM SOIL BEST.

Kafir corn flourishes best in what may be termed a warm soil, that is to say a loam soil with quite a proportion of sand in it. And because of its drouth-resisting properties it is better adapted to sub-soils of a gravelly or sandy texture than either corn or sorghum. It seems much at home on the black humus soils of the prairie. But on cheap, that is to say on stiff clay, it should not be planted at all.

It does not grow so fast as corn, and probably not quite so quick as sorghum, and as it is a warm-weather plant there is no use in sowing it before the weather is fairly warm, that is to say before the waning days of the Spring. And like sorghum it is easily injured by frost. Its value, therefore, as a pasture lies in the large amount of food relatively which it produces in the Summer season when grass pastures are scarce.

It is not of vital importance where Kafir corn comes in the rotation, but it is well to use it as a crop for cleaning more or less the land on which it is grown. It is important that the land on which it is sown shall be fairly fertile, and that it shall also be fairly clean when the Kafir corn is sown upon it so thickly that the cultivator cannot be used. This can easily be accomplished by giving due attention to that process of tillage which should precede all crops that are to be cultivated and that are not to be sown until the arrival of settled warm weather. Such tillage includes frequent stirring of the surface from the opening of the Spring until the planting of the crop.

HOW TO SOW.

It may be sown broadcast or with the grain drill. The latter system of sowing is preferable, as the seed is buried by it to a more uniform depth, and in consequence comes up more regularly. And when dry weather comes on soon after the planting of the seed it is in a better position to resist drouth influences. About three pecks of the seed will suffice to sow one acre. But when the crop is put in rows and cultivated a much less quantity will suffice.

Our experience in pasturing Kafir corn with sheep is too limited to enable us to compare the results with those obtained from pasturing sorghum. But from the said experience the inference would be fair that would lead one to conclude that in a country equally adapted to the growth of Kafir corn and sorghum, the latter would be somewhat more valuable as a sheep pasture, and in a country where Kafir corn grew more vigorously and could be more relied on, it would be superior to sorghum. As with sorghum, the earlier Kafir corn is pastured the more vigorously it will grow up again, but, of course, it should not be eaten off too early, since it is a tender plant when young.

Kafir corn is ready for pasturing about the same time as sorghum, or a little later in the season. It may, therefore, be made to provide green food for sheep from June to the end of September in the Central States, but not for so long a period in the States farther north, and it should be borne in mind that since the growth of stalk is heavier than with sorghum, the pasturing should take place before the stalk gets too coarse and large. The one point that we are anxious to make prominent at this time is that where Kafir corn will

grow well, it may be grown with much advantage in providing Summer pasture for sheep.—*American Stockman.*

Argentine Wool Industry.

An official report on the Argentine wool industry says that the introduction of refrigerating apparatus and the shipment of live animals from South America led the Argentine sheep-owners to divide their attention between mutton and wool. At the same time European fashions called for the use of long-stapled wool. The Argentine therefore began cross-breeding with a German, the "Lincoln," which is good for mutton, and whose wool, if not very fine, is very long, elastic, and soft. At the present time, more than half the wool of Argentina is from sheep crossed with the "Lincoln" breed, while the "Rambouillet" merinos are constantly decreasing. The number of sheep in the country is conjectured to be 90,000,000, and the average fleece is 4.4 pounds. The output of 1894-'95 is estimated at 370,000,000 pounds, and trade estimates for 1895-'96 put the amount at 450,000,000 pounds. There is very little home consumption of wool, and the export for six years, 1890 to 1895, aggregates 898,137 tons of shorn wool and 179,368 tons of skins. In 1895 the exports of wool to several countries were as follows: France, 81,309 tons; Germany, 48,215 tons; Belgium, 36,843 tons; United States, 12,187 tons, and United Kingdom, 2,619 tons. All wool pays an export duty, which is about \$1 for 220 pounds. Skins with wool pay about two-thirds of this.

The Illinois Sheep Breeders' Association.

The Illinois Sheep Breeders' Association met in annual meeting at Springfield, January 12. The address of President R. M. Bell was followed by an interesting and valuable paper from Everett A. Ponting, Moweaqua, on "Selecting and feeding sheep and lambs for market." Mr. A. J. Lovejoy, Roscoe, presented a valuable paper on "The value of sheep on the farm," and Mr. C. H. Mitchell, Sherman, instructively entertained the meeting with his experiences in the sheep industry. Other papers and discourses made the meeting one of profit and in many respects the best meeting the Association has ever held. R. M. Bell, Decatur, was re-elected President and Jno. G. Springer, Springfield, Secretary.

Sheep Men Were Prepared.

The storm which has prevailed in Montana for several days, while severe, is not having a serious effect on range live-stock. This is due to the fact that the snowfall has been light and there has been little wind.

The sheep men are all well provided with feed, and the storm came in such shape that they were able to get their flocks into the sheds before loss.

A Scrap of Evolution.

Somewhat less than 40 years ago, when business or pleasure compelled anyone in the rural districts to be abroad after nightfall, the lighting of his pathway was entrusted to a feeble candle or to the alternately flaring and smouldering flame of a lamp fed by some animal oil. Despite these limitations, however, the lanterns then in use were obviously in advance of those of earlier years, and their possessors, knowing of nothing better, for the simple reason that none existed, were doubtless quite content with such as they had.

A revolution in the art illuminative and a general uprooting and overturning of accepted lighting methods was, however, close at hand. In August of the year 1859, the drill of Col. Drake was the means of uncovering two or three adjacent and inquisitive Pennsylvanians with crude petroleum, as that mysterious fluid spouted from the first drilled oil well. At the time of this momentous discovery, Mr. R. E. Dietz, of New York City, had been engaged in the manufacture of lamps, etc., for 19 years, having begun business in 1840, and was already well and widely known for the excellence of the limited line of such goods as he manufactured. His products were doubtless quite content with such as they had.

With the successful refining of petroleum the world was speedily brightened by a new light, and many thousands of its inhabitants saw it at the hands of Mr. Dietz. In the next 25 years, by reason of their manifest superiority, the Dietz goods have found entrance into the markets of almost every land beneath the sun, and R. E. Dietz and his successors, R. E. Dietz Co., have been untiring in their efforts to meet, if not to actually anticipate, every want within the power of a lantern or lamp to supply.

As noted in their advertisement which appears elsewhere, the R. E. Dietz Co., of New York City, send, free upon application, a very complete illustrated catalogue of their goods. From this catalogue a clear idea of the extent and variety of their output may be obtained and the extensive line of goods designed especially for the use on the farm and in the village cannot escape notice.

DAIRY PRODUCTS.

At the Tennessee Centennial Exposition.

EDITOR AMERICAN FARMER: Please say to your readers that we are now at work on our Dairy Exhibit and would be glad to correspond with any who may be interested in our department. We sincerely hope to have the dairy interests of your section represented at our Exposition, which will be second to none except the World's Fair. All communications should be addressed to me—J. TAYLOR STRATTON, Chairman, Dairy Committee, Nashville, Tenn.

Beware of Ointments for Catarrh that contain Mercury, as mercury will surely destroy the sense of smell and completely derange the whole system when entering it through the mucous surfaces. Such articles should never be used except on prescriptions from reputable physicians, as the damage they will do is tenfold to the good you can possibly derive from them.

Hall's Catarrh Cure, manufactured by F. J. Cheney & Co., Toledo, O., contains no mercury, and is taken internally, acting directly upon the blood and mucous surfaces of the system. In buying Hall's Catarrh Cure be sure you get the genuine. It is taken internally and is made in Toledo, Ohio, by F. J. CHENEY & CO., Toledo, O. Send for testimonials, free. Sold by Druggists, price 75c per bottle. When writing mention this paper.

CRIMSON CLOVER.

(Continued from first page.)

would not think of average size, as part was lodged.

"The next was sown Sept. 14, at last dressing of late sugar-corn that followed white potatoes. The young plants were up on Sept. 17—three days. The catch was good and plants looked well, but were small when Winter set in, and



having no protection many disappeared; there are, however, enough left, but, as you will see, the plants are small. (See cut No. 4.)

"The next was sown Sept. 20, on citron patch and cut in among the crab grass and remaining citron vines with 'Clark's Cutaway'; a part twice and a part once only. Where cross-cut it is the best. The plants stood the Winter



well in the shelter of the debris (crab grass, etc.), but it will be seen that the plants are small. (See cut No. 5.)

"The next was sown Sept. 21 and 22, was cut in with 'Clark's Cutaway' on an old sand-field that had not been cultivated for three years and had, at the time of sowing, a sparse showing of small weeds. The catch was good, but a great many plants disappeared during Winter, as they had little protection; the land is now ridged 10 feet apart and planted with watermelons, the intention being to plow under the clover now growing on intermediate spaces. (See cut No. 6.)

"The next was sown in orchard on Sept. 29, cut in with 'Clark's Cutaway'



without plowing. It is alongside of the plot sown on Aug. 4, but is far better soil. (See cut No. 7.)

"The next was sown on Oct. 4, with rye, and both cut in together with 'Clark's Cutaway' on melon patch. Seed came up well, but had not attained much size when Winter set in, and many did not survive. The rye did well and is being pastured. (See cut No. 8.)

"The next was sown Oct. 23, with rye, cut in with 'Clark's Cutaway' on

late tomato patch among the vines. Fewer plants survived the Winter than of those alongside sown on Oct. 4. The rye did well and is being pastured. There was a dry period from Oct. 14 to



Oct. 23 that checked young plants' growth somewhat.

"We often notice that our rankest and most vigorous weeds, as purslane, etc., if they start into life just before Winter sets in will send up only a single slender branch, two or three inches high, and on it develops a single seed receptacle, as if assiduously only to preserve its kind merely. You will notice



many single branches of crimson clover among those I send you—the later the sowings the greater the percentage of such. In the latest sowings perhaps the majority of plants are now with single branches."

Horticultural.

Are you in want of vegetable or flower seeds, plants or bulbs, shrubs or roses, grape vines or small fruits, fruit or ornamental trees? If so, The Storrs & Harrison Company, Plainville, Ohio, will be pleased to send you their valuable catalogue free. It is one of the most comprehensive issued. They were among the first to introduce the free delivery of plants, seeds, small trees, etc., through the mail nearly a quarter of a century ago, and their business through honest dealing has grown to be one of the largest in the United States, from one greenhouse to thirty-two, and from a few acres of land to over a thousand. They advertise in our columns and are worthy of patronage. Your address on a postal will bring you their catalogue free. Send for it.

Why Iowa Farmers Prosper.

"If the Iowa farmers are paying off their mortgages and putting money in bank, it is not because of the profits made in growing corn and wheat and oats," said Mr. J. B. Newton, of the Hawkeye State, at the Elbbitt. "Their improved lot within the last decade is due to the fact that they have been sub-ordinating the production of the cereals to the dairy. The Iowa cow has proved of far more benefit as a revenue raiser than 10-cent corn, and the creamery has become firmly established as one of the institutions of the land.

"In the County of Jones the farmers have in bank deposits over \$3,000,000, according to the latest report of our State Dairy Commissioner. Here is an object lesson to the agriculturists all over the Union, for it goes to show that by proper management and attention to the right things farmers can become lenders of money instead of borrowers.—*Washington Post.*

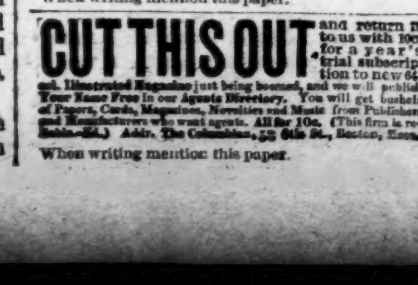
A movement has been started among a number of the progressive farmers of Georgia to have an exhibition of its agricultural products and resources next Fall.



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THE GARDEN.

Thayer's Berry Bulletin for February.

THE FARMER'S GARDEN.

Plan the berry garden as carefully as you would any farm building. Start right, and you save time in preparing the soil, in setting the plants, in cultivation, and in all the details of the work.

Make a complete drawing or plan of the new garden, and work to this plan in a regular, systematic way.

Take a piece of heavy paper, or a clean, smooth board, and draw 10 straight lines one inch apart and 25 inches long. These lines to represent 10 rows of plants seven feet apart. Now draw cross lines one-half inch apart the entire length of plot, making just 50 cross lines.

The intersection of each cross line with the long lines represents the exact point where plants should be set. This requires just 50 plants to the row, the plants $\frac{3}{4}$ feet apart in the row and rows 7 feet long.

Set strawberry plants just half this distance each way, 21 inches apart in the row and rows $\frac{3}{4}$ feet apart.

Make a selection of the varieties you want, the number of each variety and the rows they are to occupy.

Write name of berry and number of plants on the line selected. This plan requires one-quarter acre of ground, and will furnish a liberal supply of berries throughout the season for a large family. Every farmer should have such a garden.

Long, straight rows are easily and closely cultivated by horse or hand cultivator.

Fifty plants to the row may be purchased at 100 rates, thus saving in price of plants. Uniform and exact setting adds to beauty of garden and interest of grower.

The varieties to be selected depend much on soil, location, manner of cultivation, taste of grower, and other surroundings.

Select varieties known to do well in your locality if tested there, otherwise standard varieties that have done well over a large extent of country.

Order direct from responsible growers, thus being sure of good plants at moderate prices. High-priced novelties are generally disappointing.

The following varieties are recommended as doing well in most localities. The kinds and number for each row will give you early and late varieties, coming in succession during the season:

1st row. 50 Blackberries—25 Briton, 25 Snyder.

2d row. 50 Black Raspberries—25 Ohio or Older, 25 Nemaha or Gregg.

3d row. 50 Raspberries—25 Palmer, 25 Shaffer (purple).

4th row. 50 Red Raspberries—25 Marlboro, 25 Cuthbert.

5th row. 50 Currants—25 Red Dutch, 25 Victoria.

6th row. 25 White Grape Currants, 25 Gooseberries—Downing and Houghton.

7th row. 100 Warfield Strawberries.

8th row. 100 Michel's Early Strawberries.

9th row. 100 Haverland Strawberries.

10th row. 100 Bederwood Strawberries.

11th row. 100 Crescent Strawberries.

12th row. 100 Parker Earl or Gandy Strawberries.

13th row. 18 Grapes—More's Early, Worden, Delaware, Brighton, and Concord.

As soon as ground is free from frost prepare it thoroughly. Extra care in preparing ground is essential.

Stake off the rows and set plants by line, following the plan exactly. You will then have plants true to name, and on your plot a complete record for future reference.—M. A. THAYER, Sparta, Wis.

Pedigree Strawberry Plants. Pedigree plants or animals are those having a known line of ancestry—presumably good ancestry.

New varieties of strawberries originate from seed sown by man or nature. A variety thus originated propagates itself by means of runners which grow out from an old plant, take root and form young plants. A pedigree strawberry plant, as I use the term, means usually, but not always, one of the above kinds (for the ancestry of some of the best varieties is not known) which has been still further improved by repeatedly selecting plants noted for general excellence as fruit bearers, from whose runners young plants are obtained to set all new fields.

From these young plants—the most excellent ones—are again in fruiting time selected the most excellent ones, and so on indefinitely. But the berries should not be allowed to remain on these plants an hour longer than is necessary to prove the fruitfulness and general excellence of the plant. The berries should always be pulled off before they ripen or the seeds mature, which is the process so exhausting to the plant.

It is denied that this selection does any good at all, and asserted that one plant of any given variety is just as good as any other plant of that variety. That the assertion is erroneous I know from actual and repeated tests. I have long followed this plan of selection and proven that it does tell strongly in the improvement of a variety, provided of course that it is intelligently and persistently carried out. In fact, improvement in plant or animal can come in no other way.

To assert that every strawberry plant of any given variety is equally good no matter how the one may have been allowed to run down by neglect nor the other bred up by careful selection and high culture, is an error and an error of a very harmful kind.

It is as erroneous as to hold that one herd or strain of Jersey cows is as good

as any other herd or strain, although one might have been highly and judiciously fed and bred from only the best cows, and the other herd or strain had been starved and bred from scrubs for 20 generations.

The fact is that all varieties of strawberry plants as soon as originated begin a gradual process of change. It may be slow, but it is sure, and almost inevitably tends to deterioration.

My plan is to arrest and even to some extent reverse this process of deterioration by raising young plants from old plants of conspicuous merit and from no others.—O. W. BLACKNALL, Kittrell, N. C.

Climbing Cutworms.

The New York Experiment Station has been making an exhaustive study of these pests, which have the habit of spending the day in the ground at the bases of trees and at night ascending the trunks and feeding upon the buds and leaves until nearly daylight. A large variety of shade and fruit trees are attacked by climbing cutworms, as are also small-fruits, grapevines, and various flowers, especially roses and chrysanthemums. Among fruit trees, peaches have experienced most damage, perhaps because of their being extensively grown on the sandy soils where cutworms flourish best. A list is given of 12 species of cutworms that have been noted as possessing the climbing habit, and it is believed that other species would assume it under favorable conditions. The greatest damage to peach trees has occurred along the shore of Lake Ontario, where in some instances the attack of cutworms have been so severe that on still nights their feeding has produced a distinctly audible nipping sound. Each cutworm destroys several buds in a night, and when a number of caterpillars ascend a young tree it is soon killed or its growth destroyed and stunted. Where the buds are few the branches are often girdled through the bark being gnawed. During the daytime these cutworms bury themselves in the sand about an inch below the surface, usually within a radius of a foot from the base of a tree. As many as 50 cutworms have been found at one time on a year-old tree and 220 on a two-year-old tree.

The results of numerous experiments carried on at the Station for preventing the ravages of cutworms are cited. Trapping the moths by means of sweet traps and trap lanterns is believed to involve more labor and expense than the results repay, besides destroying numbers of beneficial insects, especially parasites. To combat climbing cutworms, clean cultivation is advised, to keep out entirely all weeds and grasses upon which the eggs are laid and the young cutworms feed. Clean cultivation for two or three months after the middle of July, and the growing of some garden or field crop in or near peach orchards to attract the moths and thus prevent them from attacking the trees, are suggested. To prevent the worms from getting to the buds the painting of the trunks of the trees with "Rausenlein," "Dendrolene," or some other sticky caterpillar lime has proved quite effective.

The mechanical devices which have been looked upon with favor are collars of stiff, smooth paper pulled out in funnel shape at the bottom and collars of cotton batting, a band of batting four or five inches wide being bound at its bottom around the tree and the top then pulled over in the shape of an inverted funnel. This has proved an effective barrier against cutworms, and is not readily matted down by rain.

For killing climbing cutworms jarring them from the trees at night on to sheets and digging them out of the ground during the day, although tedious methods, have proved profitable. Poisoned baits of fresh foliage sprayed with Paris green and a moistened mixture of bran and Paris green were eagerly eaten by the cutworms, which died in a few hours, in some cases 90 per cent. being killed. In gardens it is recommended that the advent of the cutworms be prevented by plowing deep furrows around the patches to be protected, and that such destructive measures as spraying with Paris green, hand picking, and the use of poisoned baits be employed. For grass lands and field crops a short rotation of crops, leaving fields but a short time in sod, is believed to be the best method of protection known at the present time.

Currants.

For propagation of currants the cuttings method is preferred, the cuttings to be made from ripe, hard wood in the Fall, stripped of their foliage if need be, and either planted at once, if early in the season, or tied in bunches and buried about six inches deep in the earth until Spring, with the buds upward to keep the top buds dormant. In this case the cuttings may be set out as soon as the ground is fit to work in the Spring. The soil for growing cuttings should be rich, well drained, and thoroughly pulverized, and the cuttings should be placed in long trenches with the top buds just above the surface. Strong one-year-old plants are regarded as the most desirable for setting. Directions are given for propagation by layers and from seed, the latter method to be used when it is desired to originate new varieties.

Currants may be planted either in fields to themselves or in vineyards

between the trellises. The distance between the bushes varies with the vigor of each variety, but about four feet apart in six-foot rows is considered a good practice.

Annual fertilizing with barnyard manure and some commercial fertilizer is considered necessary, and clean, shallow cultivation should be given until the end of Summer. Pruning in either bush- or tree-form is regarded as preferable to allowing old canes to remain on the plants.

Take Care of the Foundlings.

EDITOR AMERICAN FARMER: Many years ago, in plowing in my orchard, a small seedling strawberry plant was on the point of being turned under, but I saved it. It was what became the famous Capt. Jack, which is still retained by many successful growers.

I tried to grow the Cuthbert raspberry for 10 years, with very poor success; so much so that I routed out the whole row.

A few years ago, while cleaning up a little gully, I noticed a seedling raspberry plant, which was kept and nursed. Strong canes grew up in 1895, and in 1896 the little clump gave me more berries than the original row 50 feet long ever gave. I had no Cuthberts to compare with, but from recollections consider it exactly like the Cuthbert, from which it must be a seedling, the seeds being carried there by the birds. It is hardy, which the other was not. Quite a number of plants are now ready to set out, and if it continues to do as well as it did the past season, it will be valuable. Many of our finest fruits are accidental productions; hence the advice to give them a chance.—S. MILLER, Bluffton, Mo.

Growing Cabbage Plants.

When a large number of plants is required, it is cheaper to grow them than to buy them at 25 cents the hundred. Five cents' worth of seed will produce 1,000 plants, and, as there is no need to set them out until July for winter use, there is plenty of time to grow them in the open ground.

Soja Beans.

The Vermont Station reports: Soja beans, green and black medium varieties, were grown in 1893, as well as in 1894, and proved satisfactory each year. No other leguminous hoed crop which we have grown has given us better returns in tonnage of green fodder, dry matter, or protein.

The green variety this year yielded at the rate of six and one-half tons of green fodder, two tons of dry matter, and nearly a quarter of a ton of protein to the acre. The crop was poorer in protein than last year's growth. Although good growths were made of hairy and Spring vetches, with and without oats, our experience with these crops for several years does not lead us to consider them equal to peas and oats. Serradella yielded about a ton of dry matter to the acre. We recommend it as a promising forage crop.

Kafir Corn.

I had a very fair opportunity to test Kafir corn last year, as to drought and all, and I cannot see that it possesses any advantages in any respect over our common corn, either for grain or forage, and for the latter it is not nearly so satisfactory to me as sorghum.

Sorghum is a tenderer plant to eat than Kafir corn, and stock like it better, either when green or dried. It may be that in the sand and where there is no rain Kafir corn may be just the thing, but in any part of God's country there are other plants that are better, in my way of thinking.—CHAS. DEVINE, Iowa.

The Improvement of Unproductive Black Soils.

The unproductive areas of deep, black humus soils known as "bogus" lands occurring in central and northern Indiana, and which in many cases "were formerly marshes or the bottoms of old ponds," showed on chemical examination none of the characteristics usually assigned as the cause of unproductiveness. Experiments on two farms during four years indicate that the use of kainit and straw temporarily improved the drainage, and thus increased the productiveness of these soils. A system of drainage which taps the water-bearing gravel underlying the humus soil and lowers the water level to at least 40 inches by removing the cause of unproductiveness insures permanent improvement.

The Best Farmers' Paper.

EDITOR AMERICAN FARMER: In renewing my subscription to THE AMERICAN FARMER I desire to say I read several agricultural journals, and while I have no desire to disparage any I must say I consider THE AMERICAN FARMER superior to any of them.

Especially am I pleased with the bold and fearless stand it takes upon the question of protection to the American farmer and to all other American industries.

In conclusion I desire to say to those old Union veterans who desire to make a home in the South that this section of south Florida can offer them inducements superior to any other section in the South.

If any of the old comrades desire any information respecting this section, and will write to me for the same, I will answer promptly and fully.—E. D. LORGE, Brandon, Fla.

THE AGRICULTURAL SCHEDULE.

The McKinley Rates to Be Restored.

The Republicans on the Ways and Means Committee have decided to restore McKinley rates all along on agricultural products, particularly on those coming from Canada, and are making the rates specific instead of ad valorem, thus corresponding with the McKinley act.

The first five paragraphs in the McKinley act, which imposed duties on horses, mules, cattle, hogs, sheep and other live animals, not specially provided for, were all consolidated in one paragraph in the Wilson law, and these animals put under a duty of 20 per cent. ad valorem. The McKinley classification rates will be restored, with the exception of cattle, where the rate will not be quite so high as it was in the McKinley act, and still will be much greater than under the Wilson law.

Cattle under the McKinley act, when more than one year old, paid a duty of \$10 per head, and less than one year old \$2 per head. Under the 20 per cent. duty of the Wilson law, cattle have been coming into this country in a way greatly to injure the American growers.

The report of the Bureau of Animal Industry of the Department of Agriculture recently sent to Congress shows that 219,814 Mexican cattle were imported and inspected during the last year. From Canada there were, according to the same report, 317,038 sheep imported.

Under the McKinley act in 1892 there were only 2,169 cattle imported into this country altogether, compared with 219,814 imported from Mexico alone during the last year. This enormous increase in the importation of cattle is a great injury to American growers, and a stop will be put to a considerable extent by a partial restoration of the McKinley rate of duty and making it specific. This is an illustration how farmers and cattle-growers have been injured by the new tariff law.

The 317,038 sheep that came in from Canada, to say nothing of the Canadian wool that came in free and mutton is a further illustration of the injury to the farmer under the new law. There were \$3,300,000 worth of live animals brought into the United States last year under the Wilson law, and this, notwithstanding the fact, that these animals were valued in many cases at half the value put upon similar animals in 1892.

PROTECTION TO SUGAR.

There Will Be No Bounties, But a Specific Duty.

The question of what shall be done with sugar in the next tariff, and whether or not a bounty shall be paid, has not yet been taken up, but the probabilities are that no bounties will be authorized by the report of the Ways and Means Committee. The duty on sugar will be retained, that much has been settled, and the rates will be made specific.

Under the present law, raw sugar is persistently undervalued. The duty is 40 per cent. ad valorem, and the value of the imports is so large that the saving by undervaluation of a small percentage of the duty is an immense gain to the importer, the sugar trust.

In Great Britain sugar is admitted free, and therefore there is no reason for undervaluation. The average price of refined sugar imported into Great Britain for the 12 months beginning July, 1895, and ending with June, 1896, was \$2.45 per 100 pounds. For the same months the average price for the same grade of sugar imported in the United States was \$2.14 per 100 pounds. The difference, 31 cents per 100 pounds, appears to be a small matter, but upon an importation of 2,000,000 tons, the total undervaluation is \$12,400,000, and the saving to the sugar trust in customs duties, \$4,960,000.

In revising the customs tariff, the temptation to defraud the revenue will be eliminated as much as possible, in justice to the honest importer, the home producer, and the Government.

The Louisiana Sugar Men.


The sugar-growers of Louisiana are in Washington again for a further large appropriation for bounties. The last Congress appropriated \$5,000,000 to pay bounties claimed to have been earned before the Wilson law was passed. Although the Secretary of the Treasury paid that money out pro rata, it did not prove sufficient by \$1,048,000 to pay all the claims filed with the Treasury. This additional sum is now asked for.

It is doubtful if the money is allowed by the Committee on Appropriations. In fact, it is almost certain that under the present condition of the Treasury the money will not be appropriated. As Louisiana furnished votes to pass the bill repealing the bounty, and has sent Members of Congress to Washington to fight all Republican tariff measures, it has not much of a claim on the Republicans to appropriate a million dollars for this purpose at this time.

The Wilson tariff law could not have passed the Senate except for Louisiana votes, and as the Treasury is running rapidly behind, as it has been doing ever since this law, which Louisiana is responsible, was put upon the statute books, the bounty claim may have to wait.

Inspection of Cattle.

The Committee on Agriculture has prepared a bill which will be reported to the House of Representatives, and which proposes to compel the slaughter-houses to pay one-half the expenses of the Government inspection of the cattle slaughtered, the Government to bear the other half of the expense. While the bill will be introduced at this session, it will not be pushed, as the Committee desires that the subject shall



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Witness of the Won-
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Pinkham's Vegetable
Compound."

2939 Washington Street,
ROXBURY, MASS., April 20.

To All Sick Women:

I feel it my duty to publish the wonderful help Lydia E. Pinkham's Vegetable Compound has been to me. I was like a crazy person; could not eat or sleep; there was no rest for me day or night. Physicians examined me and said an operation was necessary. Before undergoing it, however, I determined to try Lydia E. Pinkham's Compound. I am so glad I did, for it cured me. I am a well woman now, and can do any kind of work. I want this published throughout the land, so that all my suffering sisters may read, and if in any way affected with female troubles they may be induced by my sincere statement to try this wonderful Vegetable Compound and be cured.

MRS. MARGARET BAMFORD.

Intelligent women no longer doubt the value of Lydia E. Pinkham's Vegetable Compound. They openly acknowledge that it does positively cure the multitude of painful ailments peculiar to women. All Druggists sell it.

Lydia E. Pinkham's Liver Pills and Sanative Wash assist the Compound wonderfully.

The Lydia E. Pinkham Medicine Co., Lynn, Mass.

be discussed thoroughly. The rates slaughter-houses will pay are one cent per head; microscopic inspection, three cents per piece. On the basis of last year's inspection, this tax will net the Government \$340,314.86, which will be applied toward the expense of the inspection system. This tax will be placed on all meat intended for consumption as human food that is shipped from one State to another, or to foreign countries, but will not be imposed on meat intended for consumption within the limits of the State in which it is slaughtered.

THE AMERICAN HOG ABOARD.

The Exportation of Pork Products for the Year 1896.

The exports of American hams amounted last year to 130,000,000 pounds, valued at \$12,000,000, and 103,000,000 pounds of this total were sent to Great Britain. The other countries with which there was considerable trade in American hams were Canada, Cuba and Belgium.

The exports of bacon to Europe last year amounted to 425,000,000 pounds, of the value of \$33,000,000. More than three-quarters of the product was sent to the United Kingdom, and among other countries Brazil took an important place, which imports from this country 20,000,000 pounds, Germany following with 8,000,000, Canada with 7,000,000, Cuba with 6,000,000 and France with 4,000,000.

The exportation of lard is still another important item of American commerce, amounting last year to 510,000,000 pounds, of the value of \$34,000,000. In the consumption of this article of American export the supremacy of the United Kingdom is less marked than in hams and bacon, for although 200,000,000 pounds, about 40 per cent. of the total, went to England, Germany was a consumer to the extent of 120,000,000, or nearly 25 per cent. of the total. France followed with 32,000,000, Cuba with 26,000,000, and Brazil with 13,000,000 pounds. In this particular item of exports, as in other items, Cuba as a market for American produce has lost its importance since the outbreak of the Cuban war, and furnishes each month a steadily diminished market.

The exportation of fresh beef amounted last year to 225,000,000 pounds, of the value of \$19,000,000, and substantially all of this, except an infinitesimal portion sent to the West Indies, was sent to Great Britain.

Of the exportation of salted beef from the United States to foreign countries, one-half only was sent to the United Kingdom, the balance being distributed among the West Indian islands, Germany, Canada and South American countries, the amount exported to Cuba amounting to less than \$1,500 worth in a year.

A very large market for American tallow, the exportation of which increased enormously last year, was found in France, to which 8,600,000 pounds were sent. Germany took 6,700,000 pounds, the Central American States 3,000,000, the West Indian islands, ex-

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HEALTHY OLD PEOPLE

Say the main thing to do is to keep the stomach, liver and bowels in order if you want to live long and keep well. Good physicians say the same thing, too. The remedy called

RIPANS TABULES

while not mysterious or miraculous in its curative qualities, is a simple formula prescribed by the best physicians for disorders of the digestive organs. Just little tablets, easy to take, easy to buy and quick to act. If your trouble is Dyspepsia, Biliousness, Dizziness, Headache, Constipation, Heartburn, and the like, no need of calling a physician. Ripans Tablets contain exactly what he would tell you to take.

ONE TABULE GIVES RELIEF.

PERMANENT CURE FOLLOWS A FAIR TRIAL. NO UNCERTAINTY ABOUT IT.

MILK IS AN EMULSION of butter. You don't need to be told that milk is an easier food than butter. Scott's Emulsion is an easier food than cod-liver oil. It is half digested; almost ready to enter the blood and help make tissue, nerve and bone. It is rest for digestion; it stimulates, helps, restores digestion; and, at the same time, supplies the body with a kind of nourishment it can get in no other way.



ABOUT WOMEN.

MRS. HENRY WARD BEECHER is sinking fast.

THERE IS AN OLD SAYING—however true it may be, or false, is not the question; there is an old saying that China is the land of flowers without scent, men without hearts, and women without souls.

THE STATISTICS SAY THAT more women than men live to be a hundred years old, but the few men attain to greater age, after they've once passed the century mark, than do the women.

MRS. HUNGERFORD—THE Duchess—is dead. She wrote some 27 love stories in 20 years. The English-speaking world all over the world delight in her love stories, with their inevitable saucy heroines and grave, silent heroes. Her first stories, "Phyllis" and "Molly Bawn," are the best.

LAST YEAR THE EMPRESS OF Germany ordered a brocade to be woven for her of the finest silk—white with a pattern of birds and flowers all over it. The raw silk itself in each yard was worth a hundred dollars, the entire cost being \$125 a yard. When the silk was sent to the palace for the Empress's approval she was so delighted with its beauty that she decided it would be a mistake to cut it up for a frock, and instead she used it for curtains, where the beautiful brocade shows to best advantage.

SURPRISING AS IT MAY SEEM, there are several widows of Revolutionary soldiers on our pension rolls, as well as seven truly daughters of the Revolution, who draw pensions for their fathers' services in Washington's armies. The youngest of these pensioners has seen 76 Summers; most of them are nearer the century mark. Inasmuch as the battle of Lexington was fought 121 years ago, the only explanation of these surviving widows is that they married men much older than themselves; and indeed one who was only 21 years old married, 52 years after the war, a soldier three quarters of a century old.

IT IS GENERALLY ADMITTED, says a London exchange, that there is a significance in names. Thus, Polly should be cheerful and lively; no one could imagine a silent and dull Polly. Sybil suggests softness and refinement, and Angelina sentimentality. Edith should be aristocratic, and Priscilla severe. Madeline is usually in novels a well-brad automaton; she dresses admirably, talks faultlessly, and acts becomingly. Ruth should be simple, genuine, winning, full of modesty, and sterling to the core. Pauline is supposed to be lackadaisical, pretentious and somewhat romantic. A certain hothouse aroma lingers around Blanche and Bertha. They should be kept from the trials and troubles of a stormy world. Fanny and Kate are hoydenish and somewhat scatter-brained. Mary is all that is good. Annie, gentle, graceful and good looking. Maud, somewhat reserved and aristocratic. Mable is a flirt. Eliza, plain but good. Jane is good, serious, and improves on acquaintance. Ellen is not good looking, but what men call a thoroughly nice girl. Dorothy, sweet, simple and charming. Ethel, just an average girl and no more. But, after all, a rose by any other name would smell as sweet.

A STORY OF THE FRENCH REVOLUTION: At the time of the French revolution, Houdon, the celebrated French sculptor (whose statue of Voltaire we have all admired in the foyer of the Theatre Francaise), was thrown into prison. Mme. Houdon, in despair, went to Barras, and with streaming eyes implored his assistance. Barras shook his head; he feared he could do nothing. Houdon was a man of genius, and, therefore, as David was one of the condemning judges, he feared there was little chance for his salvation. Mme. Houdon refusing to accept this opinion as final and using all the arts and beguilements of which an astute French lady is capable. Barras at last condescended to ask her if her husband had any statue for sale at that time in his studio. Madame replied that the only finished statue at present in his atelier was a figure of Saint Sulpice, holding a scroll of M. in her hand.

On hearing this the wily Barras rang the bell and said to his answering secretary: "M. Houdon has just completed a splendid statue of 'Philosophy Meditating on the Revolution.' Hasten and purchase this sublime work of art, and have it placed in the Assembly." Barras' orders were carried out, with the result that not only was the sculptor's life spared, but he received more commissions for statues than he was able to execute. On such small issues did the lives of men hang in those troublous times.—The Gentle Woman.

FADS AND FASHIONS.

The little girls in their short skirts, neat leggings, little jackets with fur-trimmed collars, and their big hats or bonnets, are most picturesque; especially if all the costume be of one color, except for the fur and some white lace in the hat.

An attractive frock, taken from the American Queen, may be made of cashmere, ornamented with rows of narrow braiding; of silk, trimmed with bands of lace, or of gingham or lawn, with embroidery trimming. The fashion is too simple a one to need an explanation. The trimming is put lengthwise of the waist and short-sleeved puffs. It can be omitted entirely from the skirt. The ribbon is exceedingly graceful and stylish, and the frills above the high collar are the latest device for pretty-prettying one's frocks. For an example, the dress may be copied



in silver-gray cashmere, with a small-patterned black silk braid for trimming, and with the belt and collar of black satin, black satin ribbons for the flying loops and ends, and soft, white lace for the neck and sleeve frills. For a black frock the style is easily adapted. For gingham frocks, with pretty embroidery and ribbons, it is equally effective.

The shirtwaist is waxing in popularity, rather than waning, and this Summer will see more and more elaborate ones than ever.

Skirts flounced, or tucked from the hem to the belt, and skirts trimmed up and down the gores, are here, and promise to be with us for four or five months longer. The tucked and ruffled skirts are only possible in fine, soft material—organdies, thin silks, lawns, and so on.

A fine line of jet beading down the seams of the front gore of a skirt makes a pretty panel effect.

Tucking of sleeves and yokes is most stylish.

White satin neck ribbons are all the go.

One may wear the soberest of dresses, but the hat is bound to be gay—cerise, magenta, violet, crimson, geranium, one or the other, or all sometimes—alas the day! are to be found on the hats.

The leather belt has disappeared from fashionable society's haunts.

It is a purple season, and Mrs. McKinley's cloak, to be worn to the Inaugural ball, will be of lavender brocade, made soft and warm with a lining of white fox fur.

There be even purple wall papers.

Dark mink is particularly becoming to brunettes; the lighter shades should be left for the blonde women. Blue fox is a fur for blondes; Astrakhan and Persian lamb are becoming to all women. The gray furs should be avoided by colorless women, as should ermine. Ermine is a trying fur at best.

Drab is much worn this year, and it's as dull and ugly as ever, but dress-makers by putting black trimmings with it produce a stylish effect, perfectly satisfactory to themselves, if not to others.

Black taffeta ruffled with velvet ribbon promises to be fashionable for afternoon and evening frocks. Black taffeta, however, is a more or less harsh and gloomy material, and unbecoming, even when softened with the velvet.

Many of the new organdies look as though ink had been splattered over a light background, as the children do "splatter work."

Violet toques are very stylish.

Velvet ribbon edged with lace is used for trimming silk waists.

Satin ribbon is pretty for frills, for alpaca skirts.

Linen frocks will be much worn this Summer, and are very serviceable.

Guipure is popular, and has been for several years. It makes a handsome trimming.

Put a ruffle around the bottom of your kitchen apron; it will save the dress hem wonderfully.

HERE AND THERE.

One of the papers has a funny take-off on the Woman's Page. It describes how to make a refrigerator out of an upright piano. The instructions begin: "Carefully remove the key-board and viscera. Have some sheet-iron ready which you will cut with the scissors to the required size; have prepared a lot of powdered charcoal; sew the sheet-iron together with a very stout needle and thread and place it in the piano as a lining. In the interstices between the piano and its lining pour the charcoal (if any of the latter is left it will come in handy as a dentifrice), and, after you add a drain-pipe, your piano ice-box is complete."

It is quite a fad now to let babies and children go barefoot. It is argued that if the little one has never worn shoes and stockings, his feet will be no more sensitive than his hands, and that he will be the sturdier for being barefoot so much. Many little children—besides those who have to go barefoot from early in the Spring until late in the Fall, and all the year round go barefoot in the house. But the little country boy knows best what to do. He leaves off his shoes and stockings when the first dandelion comes, and puts them on again at the first good nip that Jack Frost gives his toes.

Red and yellow lamp-shades give a light that is very injurious to the eyes, so all oculists say.

If soot be dropped on the carpet, sprinkle salt generously over it and brush up the soot and salt. The salt holds the soot and prevents a smudge.

A new idea for raising money for a church or charity is to have a genuine German Kaffee Klatsch—to serve coffee in big cups, with plenty of cream and sugar and all sorts of German coffee cakes and buns, and gossip must not be omitted. The German maidens always little love stories of handsome Lieutenants, when they have their coffee at 4 o'clock in the afternoon. To return to Kaffee Klatsch for the church, charge 25, 30 or 50 cents for the coffee and cake, but don't have any admission fees.

A sponge soaked in water and kept wet, sprinkled with seed and hung in the window will soon be bright and green with tiny plants, and will be a continual joy to the children. Grass, clover, flax, or mustard seed can be used. A piece of coarse flannel well wet and put in a saucer and sprinkled with seeds will soon be a pretty mat of green if kept well moistened.

Many physicians argue that it is foolish to say that the exercise of bicycling is exactly like that of running the sewing machine; that bicycling is a thousand times more healthful, which decision will please the girls. While it is perfectly ridiculous to find a girl who can do a 30 mile run on a bicycle, she is too delicate to run the sewing machine or sweep the parlor, yet it is equally foolish to say that these house-keeping duties are just as good for her as bicycling. The one involves brisk exercise with shoulders straight and lungs taking in big quantities of fresh air, the others involve good enough exercise, but machine sewing usually involves bent shoulders, and sweeping means a work that will develop pretty arms but involves breathing an atmosphere so dusty that, unless the windows of the room be opened wide, it is actually injurious.

Another statement of physicians is that tea drinking is almost as bad for the women as whiskey drinking is for the men. Many women drink tea to excess, and thus ruin both nerves and digestion, temper and complexion.

There is frequent talk of the advantages to be gained from brushing the hair with a silk handkerchief. The idea is to rub the scalp well first with the handkerchief and then stroke the hair lightly with it, separating the hair into small strands for the purpose. The silk is said to be most efficient in ridding the hair of dust and superfluous oil.

A chemist says that if flowers be pressed between sheets of blotting paper that have been dipped in a weak solution of oxalic acid and water and then well dried (the blotting paper must be well dried) the flowers will not lose their coloring, but will remain fresh and bright.

When a black boot becomes skinned, as black boots will, the best treatment for it is to rub the little white place with a few drops of oil that has been colored with black ink; or vaseline blacked with ink will do.

"Children Teething."

Mrs. WISLAW'S SOOTHING SYRUP should always be used for children teething. It soothes the child, softens the gums, allays all pain, cures wind colic, and is the best remedy for diarrhoea. Twenty-five cents a bottle.

WOMAN'S WISDOM.

A Chapter on Geraniums.

Probably nothing else tends to cheerfully brighten a room, that may otherwise be quite commonplace, in so large a measure as a window or two filled with beautiful blooming plants. They cheer the passer-by and cause him to forget for the moment that mother earth still wears the white, fleecy mantle of Winter. To us within each up-turned blossom seems like the face of a dear friend.

We watch the embryo bud, that the eye of the inexperienced would scarcely discover, hidden away so securely among the numerous green leaves. We tenderly nurse it day by day, until the delicate petals unfold and, lo, we have a blossom of rarest beauty. Not every one can possess the rare exotics. Many of us, especially the busy farmers' wives, have little time to devote to the care and culture of house plants.

However, there are many plants that require comparatively little care, and repay one amply for the time bestowed upon them in their wealth of flowers. This is especially true of that well-known and rather old-fashioned stand-by, the geranium. Perhaps no plant is more universally grown, both by rich and poor, by the amateur as well as the professional florist, than this.

The geranium is sometimes grown in anything but an object of beauty; but few plants make a better display or are more lovely than the geranium when properly grown.

The bare, straggling canes of an old geranium are an eyesore to lovers of the beautiful. There is little use to fuss with an old geranium unless in the open border, and even here the young plants are far superior to the old.

A great many house plants bloom much better in a tin can than in earthen flowerpots. This is especially true of the geranium. A tin can is not an object of beauty, but a coat of paint will make it quite as presentable as a pot, and when it becomes the worse for wear it can be easily replaced.

I prefer to start my geranium slips in Spring, breaking them rather than cutting them from the parent plant. If time is at a premium I merely fill a shallow box (a cigarbox will do) with clean sand, and plant the slips in that. The box is then set in an east window, and if the sand has been kept sufficiently wet they root in from 10 to 14 days. However, I much prefer to take clean tin cans that have been given a coat of paint of some pretty color, put a few pieces of broken crockery or a handful of clear coal in the bottom, for drainage, and then fill up with soil. Any rich garden soil will do. When the cans are about full I make a hole an inch or so in depth, with a stick, in the center of each can of earth, fill it with sand, and then put in the cutting. Water thoroughly after planting and set in a not too sunny window. Sprinkle the foliage every day, but guard against over-moistening the soil. My slips are usually put into pint cans, where they remain until August, when, if the roots seem to require it, they are transferred to a quart size. I carefully pinch out all buds and train the plant in the way it should grow. Pinching out the flower buds seems almost a pity, but a plant will bloom much better during the long Winter if this course is pursued in the Summer season. At least once each week my plants are treated to a generous bath. This is usually on wash days, if I'm not too tired. Each plant is taken from its place in the window, the pot turned bottom up in the palm of my hand, and the whole plant immersed in the clean, warm soap-suds. If the plant is in bloom I am careful to wash it so as not to injure the flower. No matter how thoroughly clean the upper side of the leaves may be, the bath is practically a failure unless the under surface has been thoroughly wet, for it is just here that the plant louse and that destructive pest the red spider has his abode. My geraniums are always sturdy specimens of their kind. A lanky, long-legged geranium is an abomination in my eyes. Frequently the trusses are as large, or nearly so, as an ordinary saucer. One little six-inch Brunetti bore a bunch of flaming scarlet flowers 13 inches in circumference.

Gen. Grant is nearly identical with Brunetti, except that the color is not quite so brilliant. It is, however, a much better bloomer. One of the most beautiful geraniums I ever grew is Gen. Faidherbe. It has the most velvety texture imaginable. The individual flowers are large, perfectly double, and of the darkest scarlet, shaded with maroon. The truss is of good size borne on long, slender flower-stalks. The habit of growth is rather delicate. A profuse bloomer.

Mrs. E. G. Hill bears trusses of good size and shape. Its color is a lovely, pure pink overlaid with a delicate lavender shade, which gives to the flowers a beauty entirely its own. Apricot is another fine double variety. With me it has proven an exceptionally good bloomer. In color it bears out its name, being a fine, clear apricot. Its truss is very large and somewhat loose, which allows each individual flower to show off to the best possible advantage. It is a good grower and always presents a neat, compact appearance.

Another geranium, the name of which I cannot recall at this moment, is a prolific producer of clear lavender-colored blossoms, a most unusual color for a geranium.

There are many good white varieties, of which La Favorite is doubtless one of the best. It is pure white and entirely free from the greenish tinge generally seen in the whites. Souvenir de Mirande is truly a gem, a blending of pearly-white and several shades of pink.

It is single, but fully as beautiful as the double.

Lumiere Electrique is all its name implies. I never saw a single geranium that carried as large or as bold a truss. In color it is a peculiar crimson, soft and velvety, with bright-orange center.

Gloire de France is a double of delicate rosy-pink. I like Aaa Gray better, however, though the color is not so delicate.

Golden Dawn has, I think, been lauded beyond its merits. It certainly is not yellow.

The double-flowered geranium is usually more highly esteemed than the single, but I scarcely understand why this should be; for, with the improvement that the single geranium has undergone in the hands of successful growers, it seems to me, it leaves little to be desired.

No collection of geraniums would be complete without the old rose variety. It is not grown for its flowers, which are insignificant, but for its foliage alone. I like to have several of them, so that I may cut liberally when I desire.

Mrs. Taylor is a variety that combines fragrant foliage with really pretty flowers. Then, there is another pretty variety, the leaves of which are margined with pure white.

Of fancy-leaved varieties of the non-odoriferous sort there is a large list to choose from.

Variagated geraniums are not intended for bloomers. Their beauty lies in the foliage alone, which is certainly pretty enough to make up for the insignificant flowers. Vari-colored geraniums should not be allowed to bloom, or it will detract from the beauty of the foliage. They should also have larger pots than the blooming kind, for plenty of space encourages luxuriant leaf growth; and this is just the reason why so many windows are burdened with barren geranium plants. A root-bound plant is generally a prolific bloomer.

I might go on almost, like the brook, forever, but will close, however much I should like to tell you of some of my other favorites. Anyone can have nice geraniums who follows my plan, and the pleasure derived from them in one Winter will repay many times over the care and time bestowed.—Mrs. HARRY TAPPAN.

Getting Ready for Spring.

Although the warm days of Spring are not yet with us, yet it is not a bit too early to begin, in a way, to make gardens of both flowers and vegetables. So many of our annual flowers are best started in the house that one is often puzzled how to make room for them all.

Many plants of small size are easily started in the margin of soil of large house plants, which chance to be in large pots. Then they would be certain to get the best of care.

Old tin cans, which can be placed in good positions on the kitchen window-sills, are good things in which to start many tender annuals; for not everyone can have a hot-bed for such purposes. Many seem to find it a difficult matter to get plenty of soil in which to plant their seeds before the snow is gone, but there are usually to be found in most cellars, whose owners cultivate flowers, a few pots or cans of soil which had once had flowers in them, which had either died a natural death or cold weather untimely stopped their growth. This soil, although somewhat impoverished, is good enough for starting seeds in.

Some of the larger flower seeds are more apt to germinate if soaked for a few hours in slightly warm water before planting.

In slipping plants for use in the flower bed the coming season, the "water method" will be found more certain than any other. In this method, if but a few slips are to be started, a cup or glass or any dish holding about half a pint of water will answer. It must be nearly full of water, then the slips should have their largest leaves removed, then they may be placed in the dish so that the water comes up to the leaves, but not over them. The leaves may rest on the edge of the cup and thus prevent the slip from becoming entirely submerged. In a few days the tiny roots will start, and in about two weeks they may be planted in a small pot and receive the usual treatment.

In starting early plants for the vegetable garden the necessary care given the tomato in its earliest stages is too well known to need mention; but methods of starting melons and cucumber plants in the house are not so well known, owing to the difficulty with which such plants are transplanted. The safest method is to procure seeds several inches square, turn upside down in old pans, and plant a few seeds in each soil; then place where they will be in the sunshine, and water daily. Then when the weather is warm and all danger of frost is over the seeds can be placed in the hills, and the plant will not feel the shock of transplanting at all.

In country places it is often difficult to procure onion sets for the purpose of raising early onions.

In such a case, perhaps, what is known as the California method would be useful; that is, planting the onion seed in boxes of dirt in the house, or else in hot-beds, and transplanting the plants to garden beds about the time the seed is usually sown in the ground. In this way, it is claimed, large quantities of early onions are raised for market, as they bear transplanting safely, and attain a large and uniform size.—Mrs. O. W. CRAWFORD.

Practical Farming.

We feel that we owe our readers a favor by calling their attention to an essay on articles by J. P. Vissering, Alton, Ill. It is the compilation of the experiences of one of the best farmers in relation to this useful plant. It treats of the different kinds, their uses and enormous yield, often over 1,000 bushels to the acre. No farmer north or south can fail to derive profit from study of the counsel it gives. It can be obtained free. See its advertisement, page 8.

SEEDS FOR AN ENTIRE FLOWER GARDEN FREE!

For several years past we have made liberal offers of trial seed packages to our readers. Our seed packages are made up of the most valuable and beautiful seeds, and are sent to our readers free of charge. We have now a new and improved seed package, and we are sending it to our readers free of charge. The package contains seeds of the following plants: ... (list of plants) ... We have now a new and improved seed package, and we are sending it to our readers free of charge. The package contains seeds of the following plants: ... (list of plants) ... We have now a new and improved seed package, and we are sending it to our readers free of charge. The package contains seeds of the following plants: ... (list of plants) ...

A Serge Frock.

A neat, serviceable frock may be of dark-blue serge, with a bolero of Scotch



plaid silk. Bias bands of silk trim the sleeves.—Harper's Bazaar.

HOME TABLE.

Strawberries should not be allowed to monopolize the shortcake combination when other fruits make most delicious desserts when spread between a well-made, very short shortcake. A tart apple-sauce served in this fashion, with good cream and a hard sauce, is particularly good. Make the hard sauce by creaming together butter and sugar, and as it is very rich do not make a large quantity of it, although it will keep over a day or so, if put in a cool place.

Rice croquettes are made of rice, eggs and milk, rolled and patted into little cakes, which are browned in butter. Use one egg for a cupful of boiled rice. If the mixture be too dry, use a little milk; if too wet, flour, cracker crumbs or bread to thicken it a bit.

MUSTARD SAUCE.

Mix with a little vinegar one large cup flour and one-fourth cup ground mustard, butter size of an egg, one even teaspoonful of black pepper, two-thirds cupful sugar, ground spice of any kind to suit the taste; stir these ingredients in one quart of vinegar (boiled), and boil through; keep well closed, or it will harden. I put it in small, wide-mouthed bottles. Very good on fresh meat or salt fish.

SWEET BISCUIT FOR THE SCHOOL LUNCH.

To two cups (heaping full) of flour take two teaspoonfuls yeast powder, a half cup of sugar, and a small cupful of cleaned currants, and cream sufficient to make out into biscuit, instead of making balls. They are nicer rolled by the hand into lengths, then joined, forming rings. If sour cream is used put a salt-spoon of soda in, to sweeten; bake a delicate brown. The children will want them often.—A. M. CONNELL.

CHICKEN GUMBO.

A pet Southern dish is chicken gumbo, a thickened soup. To make it the chicken must first be cut, rolled in flour, and browned in lard that is flavored with sliced onion. After the chicken is browned drain off the superfluous fat and stew the chicken until it is tender, peppering it well and using enough water to entirely cover it. When the chicken is tender slip the meat from the bones and let it stew some more. Put in also a generous supply of oysters (add them when the liquid is boiling) and allow them to cook until the edges begin to curl, then 'sift' in slowly fine okra powder for thickening, and when the liquid becomesropy the gumbo is done. Serve with a table-spoonful of rice in each soup plate. The file powder is made of young saffron leaves dried and powdered. Powdered okra pods are equally good.

Sugar gingerbread for the little folks and big: One-half cup butter, creamed, with two cups sugar; one-half teaspoonful salt; one and one-half tablespoonful ginger; one cup sweet milk; two round teaspoonfuls baking powder; flour to make a good dough.

A DELICIOUS COLDSALAD.

Take a cabbage, wash it and cut off the outside leaves, leaving only the tender part. With a sharp knife slice the cabbage into thin shreds, put in a dish and cover with a sauce made in this way: Put in a sauceman one egg, one-half cupful of vinegar, two even table-spoonfuls of granulated sugar, a small teaspoonful of mixed mustard, two ounces of butter, and a pinch of salt. Stir constantly this mixture until it thickens. Do not let it boil.

Hominy is a much-neglected food. It is cheap, nourishing, palatable, and easy

to cook, and should be a household staple. Split-pea soup is another inexpensive, delicious food.

A recipe for salmon on toast reads as follows: Open the can and set it in a kettle of boiling water, that it may heat thoroughly. Let it heat for at least a quarter of an hour. Have ready slices of nicely browned and lightly buttered toast, and also a cream sauce. Make the sauce by creaming together a scant tablespoonful of flour and a tablespoonful of butter. Let this melt, and then add one cup of cream or milk and let it cook until it thickens. When the salmon is heated through, take it off and quickly remove from it the bones, fat and skin and break it up lightly. Spread the salmon on the slices of toast and pour over it the cream sauce. Serve hot.

Good, wholesome buckwheat cakes are made by taking two cups of buckwheat flour, one of white cornmeal and one-half cup of white flour, mix with sour milk, and then add yeast to raise. Or if you have no milk use water, and let the batter stand long enough to sour. When wanted for cooking, add a teaspoonful of salt and two of brown sugar. This last is to make them brown on the griddle. Beat well, and just before pouring on the griddle beat in some soda dissolved in hot water, cook a tiny cake to see if enough has been used; if not, stir in more, but if too much is used at first be sure you can't take any out. The batter must pour freely from the spoon, but must not be too thin. A little experience will set you right in being able to tell. Honey or maple sirup is the most appropriate accompaniment for these, but if you have neither, a sirup made from light-brown sugar is very nearly as good. Put the sugar into a sauceman and add hot water to dissolve, care being taken not to get too much water, for the sirup to be nice must be thick when cold. Put onto a very hot stove and bring to a brisk boil. Skim and strain through a thin cloth that has been wrung out of hot water.

SINGERS AND ARTISTS GENERALLY are users of "Brown's Bronchial Troches" for Hoarseness and Throat Troubles. They afford instant relief.

EXCHANGE.

The following patterns are all in excellent condition, and have been purchased within a year, all have cuts of the garments on pattern and the amounts of materials, etc., required. Will exchange for music or reading, or will send any one, for three 2-cent stamps or two for five 2-cent stamps.

LADIES' WAISTS.

Ladies' basque with ripple peplum sewed on (closed on left side). Bust 38 inches.
Ladies' basque, with revers Jabot Medici collar. Bust 34 inches.
Carrollton waist (very neat). Bust 34 inches.
Dundee waist, revers and gathered vest. Bust 34 inches.
Ladies' blouse, box plait, fancy collar, ripple below belt, full Bishop sleeve. Bust 34 inches.
Ladies' basque, revers and vest in one, box plait front and back, and ripple back. Bust 38 inches.
Ladies' Watteau tea gown or wrapper, with blouse, front and fitted lining. Bust 34 inches.
Skirts—Infanta circle, Mayfair, both medium size. Ladies' five gore ripple skirt; five yards at bottom, 28 inches waist.
Ladies' blouse vest with box plait. Ladies' Eton jacket, (very pretty collar attached), both 34 inches bust.
Misses' costume with seven gored skirts, 16 years.
Misses' melon or mandolin sleeve, 16 years.
Misses' double-breasted Reefer jacket, 16 years.
Misses' Northcote Blazer and Tadford skirt, 14 years.
Misses' Yoke waist, 14 years.
Boys' circular skirt, 4 years.
Boys' long overcoat with three capes, (can be worn with or without capes), 5 years.
Boys' costume (with waist), jacket, and white blouse, 2 years.
Child's Yoke Dress, 2 years.—Mrs. ALMA COLD PICKERING, Plainfield, Wis.

How Some of Our Readers can Make Money. Last month I cleared, after paying all expenses, \$55.55; the month previous \$28, and have at the same time attended to other duties. I believe any energetic person can do equally as well, as I have had very little experience. The Dish Washer is just lovely, and every family wants one, which makes selling very easy. I do not overvalue. People hear about the Dish Washer, and come or send for one. It is strange that a good, cheap washer has never before been put on the market. The Iron City Dish Washer fills this bill. With it you can wash and dry the dishes for a family of ten in two minutes without wetting the hands. As soon as people see the washer work they want one. You can make more money, article on the market. I feel confident that any lady or gentleman can make from \$10 to \$14 per day around the home. My sister and brother have started the business, and are doing splendidly. You can get full particulars by addressing the Iron City Dish Washer Co., Dept. 1, Sta. A, Pittsburgh, Pa. They will send you a circular, and if you make money you will be glad to send it to them.

When writing mention this paper.



Soon after our marriage, I went with my husband to the farm he had inherited from his parents. I had been reared by an aunt living in the city, and knew as much about a farm as of a jungle in India. But, I could soon learn. I should speedily become famous as a farmer's wife; there was no doubt of it.

The nicest, sweetest butter, the cleanest, freshest eggs, the plumpiest chickens, the finest lettuce and radishes, together with delicious berries, should grow from my farm. I had decided on that.

The first churning of butter looked like ice cream, but possessed none of its coolness, while a spoon was far better than a knife to use when handling the butter, greasy stuff. Eggs there were, but the contumacious old hens were utter heathens. They had no government over themselves or each other; quarreled, ate their own eggs, the cannibals; all sought to deposit in the same nest, and as for sitting they reminded me forcibly of that classic couplet on woman's will:

"If she will, she will, you may depend on't. And if she won't, she won't, and there's an end on't!"

Woman's will, indeed! Why, it is lamblake in comparison to that of a broody hen. Three or four would perhaps quarrel over the same nest, and when, by superior strength or stratagem, I had secured all but one and given her a nest of eggs, she would keep them warm just long enough to spoil them for food and then walk serenely away, with never a hint of chickens. Then just try one of those prisoners on that deserted nest she had been so ambitious to occupy, and though she might have been sitting, industriously, for a week on a brickbat, she would run into any hiding place as if in fear she might do something desired of her. The few chicks that came and promised to stay were decimated by cholera, rump, hawks, rats and weasels. The lettuce was infested with creeping and the radishes by boring things, while the berries left by the hens and birds were hardly enough for our own table.

No, I did not like the farm. It was a care and vexation, apart from the unceasing toil. Help was hard to obtain. Girls do not like the drudgery and seclusion of farm life. They wish to see and be seen, and when they have a day out they want to live where they can enjoy it. If I succeeded in securing a good girl, very likely one of the hired men would make the discovery as soon as I, and coax her away for a wife. Then perhaps I would be alone, with all the work on my hands, for weeks.

Sometimes I was even glad to have "Crazy Catty," as she was called in the neighborhood. She was a woman of 40, perhaps, harmless, but a monomaniac. Her mind had become unsettled during a religious excitement, and her hallucination was that she had a call to preach to the unconverted. She preached, prayed, sang and quoted Scripture in season and out of season. She had no relatives, but Christian people watched that she did not suffer for food or clothing and gave her a home whenever she would accept one. She was clean, and whatever she did was neatly done. But the spirit of unrest possessed her, and she might be here to-day and miles away to-morrow. I found the best way to manage her was to give Scripture for



"CATTY" POLISHING TIN.

Scripture. For instance: She was washing the milk-pans and pails when, suddenly, she dropped the dishrag and exclaimed:

"I hear it! 'Get thee out of thy country and from thy kindred and come into a land which I shall show thee!' I must go!"

"No, Catty, that was never meant for you; you have no kindred here. Perhaps this is for you: 'And whatsoever house ye enter into there abide.'"

"Even so, Amen!" and she went on rattling the tinware and polishing it until it shone again.

She stayed over a week, and then all I could offer to silence the "voices" was vain. "Go ye into the world and preach the Gospel to every creature," was not to be answered by me, and she went.

The next day, I think it was, a man came to buy our farm. We never knew who sent him or why he came. But he was there and offered \$6,000 cash down. We had sometimes talked of selling, and buying a smaller place. Now I was tired of it all, and wanted to go to town. The stock and farming implements would sell for nearly or quite \$2,000.

"With \$8,000," I said to my husband, "you could surely go in business. And what about a home for you and the children?" he asked.

"Nonsense!" I replied; "you can buy a little home, or even put us in a rented house."

"Yes, and perhaps fail, as many business men do, and leave you all homeless. No, if I sell, which I do not think at all likely, my first act will be to secure a home for you and the children. I have never yet lived in a rented house, and hope never to place my family in one."

It is unnecessary to tell how the case was argued, but I had my wish.



THE MONEY FOUND.

The place was sold and the money paid. To tell the truth, when all was done I did not feel quite satisfied. I knew my husband had acted against his better judgment to please me.

The stock and implements were to be sold at auction, at a later day, and we were to hold possession until then.

The business had been done at the house, and when the purchaser and his lawyer were gone, I asked my husband if it was safe to keep the money in the house. He laughed, for the first time since I began to badger him about selling the place, and said: "Shall I throw it out doors?"

"It is too late to go to the bank to-night," he continued, "but early in the morning I shall ride over and have it deposited in the vault, for safe keeping. Have you a piece of oiled silk which I can wrap around the bills?"

I had just what was required, and a compact parcel, tied with red tape, was carefully placed under his pillow.

"Come, don't get fidgety!" he said, cheerfully, as I watched him fastening the doors and windows. But I was nervous, and lay awake, listening to the slightest noise. And, finally, I heard one which I knew but too well.

Donny, our youngest, was battling with the croup. In less time than it takes to tell it we were up-stairs—our room was on the ground floor—and his father had him in his arms. The hired man was sent for a physician, and I did what I could until he arrived. The doctor had taken him through one attack before, and knew just what he could do. By daylight the worst was over, Donny was sleeping, and the physician left us. Then I persuaded my husband to go down and try to get sleep. He went, reluctantly, and was back almost before I had missed him. I shall never forget the look on his face, never!

"What is it," I whispered?

"Now, don't fret, dear! You must know," he said, just as cautiously. "Some one has taken the package! But I shall find it, never fear!"

I crept softly from the little sleeper, down stairs, to our room. The window I had seen so carefully fastened was open, a pane broken, through which, evidently, a hand had been thrust, to undo the fastenings. Yes, the package was gone. Our farm had traveled off through that open window. Then came the unavailing search. Detectives were employed, rewards offered and the robbery published in half the papers of the State, but not the slightest clue was forthcoming. The ground beneath the window was a velvety sod and showed no trace of a footprint.

All kind of rumors were afloat. Suspicion fell most heavily on the purchaser and his lawyer. They were the only ones, but ourselves, so far as we knew, who were aware that we held the money. Even the hired man had been purposely misled when he was called in to affix his signature as witness to the deed. My husband was cheerful, or, at least, seemed to be. Never by word or look did he reproach me! I, who had been the unlucky Eve who lured him from his Eden. The man who bought the place was quick to discover the atmosphere of suspicion, even dislike, in which he should be obliged to live, and decided not to take possession of his property for awhile. Indeed, he came and asked us to stay on the farm one year, rent free, as his contribution for our great loss. Most decidedly not, on such terms! But we should be glad to stay as renters, giving him his exact share of the profits.

"As you please," he said, very gently. "I should have been gratified to have you keep what justly belongs to you, as you have no equivalent. It is just as well for me, and better for my two oldest children, who wish to graduate at the school where they now are."

When he was gone I asked myself, as

I had done many times before, if this could be the one who had wronged us.

We took up our heavy burden of care and toil once more, and went wearily on our way. I would keep no girl, and worked on with a sense of doing penance for my sins. But the mental and physical strain was telling on me. And three months after the robbery, I think, I should have broken down entirely had it not been for the timely arrival of "Crazy Catty."

"Peace be with this house," was her greeting. Then her restless eyes scanned my face and she added: "Whom the Lord loveth he chasteneth."

"O, Catty! have you come to stay awhile with me and help me," I asked.

"Yes, verily! I will tarry for the good of your soul. Ye were as sheep going astray, but now ye are returned to the Shepherd and Bishop of your souls."

She had been with me nearly a week, about as long as she ever stayed anywhere, when I went to her room to get the sheets and pillow-slips for washing. As I took up a pillow, I wondered if I was not dreaming, as I had often done before, of that package of money! There was surely a package, done up in oiled-silk and tied with red tape.

Grasping it, to be certain, I rushed to the field where my husband was husking corn. "I have found it, I have found it!" I repeated, waving the precious parcel toward him.

When I told him where I had found it, he said, dubiously: "Then I am afraid it contains nothing valuable."

"Oh! don't say that!" I fairly gasped.

We opened the package, and found it contained the price of our farm, the notes just as he had placed them nearly three months before. We went to the house and into the kitchen, where "Crazy Catty" was doing up the morning's work and singing "I have a Father in the promised land."

"See here, Catty! Do you know what this is?"

"O, yes! it is the price of your immortal souls. 'For what shall it profit a man, if he gain the whole world and lose his own soul? It is easier for a camel to go through the eye of a needle than for a rich man to enter the Kingdom of Heaven.'"

My husband went close to her, where he could catch her wavering eyes, and said: "Catty, do you know that I could have you put in prison for stealing?"

"He who steals my purse, steals trash!—May God forgive me! that is not Scripture," she said solemnly.

"Once more, Catty, I tell you I could have you arrested for stealing; could have you put where you could not labor for the good of souls. But if you will tell me how you got this money, and all about it, I will let you go on your mission, whatever it may be."

"Tell you? Oh! yes, I remember it all. I heard a man say he should pay you \$6,000. Now, I knew you never could get into Heaven with all that money; and I prayed for help to save you both from the wrath to come. And my Master told me to despoil you, even as the children of Israel did the Egyptians. It was dark when I came, but I listened, and learned where you had hidden the bait with which Satan had tempted your souls. I did not know how I was to save you, but my Master made a way. I broke the glass—what is a pane of glass to two immortal souls?—pressed the spring, opened the

window, and, praying without ceasing, stepped in. There was a light burning, as there ever is for the faithful. When I had the riches I knew I had opened the gate of Heaven for both of you. And away I went, the angels bearing me up, lest at any time I should dash my foot against a stone."

"But if it is such mischievous stuff, why did you keep it, Catty?"

"Why, you see, I did not know what to do with it. My Master did not tell me. It was not mine. I knew it was yours, but that you must not have it, to keep you out of the Kingdom. So I kept it, waiting for a voice."

"But where did you keep it," I asked?

"In my pocket by day, and under my pillow at night. And now you must give it all to the poor, and then you can go straight to Heaven. My Master says so in His Holy Word. 'Turn ye, O! turn ye! for why will ye die? Oh! house of Israel!'"

We left the poor crazed thing resting in the kitchen, while we considered what was best to be done. She certainly was not a safe person to be at large, and we concluded it was best to consult the proper authorities. They were quick to decide there should be no risk of others suffering at her hands, as we had done. She was to go to the County-house. And it devolved upon me to persuade her to go willingly. This I easily accomplished by showing her the great need of a missionary among the unconverted inmates. She went cheerfully, even eagerly; and a little judicious watching kept her there.

I would gladly have remained on the farm after my bitter experience in trying to escape it, and even urged my

husband to make an offer to repurchase it. But he would not listen; he did not want it. Those three months of uncertainty had rendered it wholly distasteful to him. At the end of the year we came West, where he was fairly successful and I find employment in something I like far better than trying to subdue broody hens or wisely managing "Crazy Catty."

A FUTURE FOR THE CORNSTALK.

A Scientist Predicts That It Will become of the Greatest Value.

At a recent dinner at Washington, D. C., Prof. Gibbs, of Philadelphia, made the speech of the evening. He said that within a few years the cornstalks which are now thrown aside, burned and otherwise destroyed to get them out of the way would be fully as valuable to the farmer, if not more so, than the corn itself. The corn pith has been discovered by scientific experts to be the most valuable vegetable which can be found for purposes of protecting the sides of battleships from in-rushing water after being struck by shells. To-day the best of such padding is made from the coconut fibre, which has to be imported into this country at a large cost. By actual experiment the pith of the cornstalk has been discovered to be almost twice as serviceable as the coconut fibre, and in addition its cost is less and product greater. The Messrs. Cramp, of Philadelphia, proprietors of the largest private shipbuilding plant in this country, have pronounced in favor of the pith for the purposes of thus protecting battleships. They state their belief that within a few years, after its value has become generally known, all the battleships of the world will be protected with this pith from the cornstalk, properly condensed into a sufficient hardness to prevent water entering a ship which it protects. Already a large plant for the manufacture of this pith cellulose has been established in Owensboro, Ky. Though now temporarily destroyed by fire, the plant will be rapidly rebuilt on a larger scale. Messrs. Cramp and Gibbs and other Philadelphians of wealth and distinction are said to have invested large sums of money in the enterprise.

So much for the pith of the cornstalk. This use of it is promised by experts and ship builders, and its manufacture into protective pads is now being perfected by actual experiments. Prof. Gibbs, after delighting the ears of his Western listeners with the account of the newly-discovered uses of pith, turned his attention to the stalk itself, the fibre of which, he declares, can be put to many uses, the receipt of which seems like the revelation of a new and unexpected harvest to the Western farmers. The pith will, afford one material of modern warfare, and the fibre is also to be used in battle; one for defense, the other for offense. Smokeless powder can be made from the stalk, declared Prof. Gibbs, at a total cost of 15 cents per pound, while the smokeless powder which the Government now buys costs several dollars for a like quantity. The saving here is so enormous that its great value is at once apparent. As has been proven by actual experiments made and sworn to by chemical experts of the highest standing in the country, in Government service and to a beautiful lacquer, perfectly waterproof and of hardness sufficient for uses to which it would be put, can also be made from the stalk. Celluloid, too, it is claimed, can be manufactured cheaper than from other substances. Continuing, the Professor declared that cornstalks could be rendered into fodder for cattle as good and as wholesome as corn itself. The reason that cattle cannot eat the stalks now, he said, is because it is in such a state, with pith in its raw state clinging to it, that it is nothing but an indigestible mass and swells in the stomach, preventing a quantity sufficient for sustenance to be eaten.

With the pith drawn out to be used for other purposes, the stalk can be ground with a mixture of ether preparations, which would be so cheap as to be within the means of everyone, the very best of fodder manufactured, upon which cattle would thrive. The Professor cited an instance in point. Cattle fed from the swill of distilleries are, he said, of such poor quality for meat that only the very poorest people eat the beef. Before slaughter the cattle grow thin, the hair drops off, and death would quickly come by natural process did not the butcher's art intervene, sparing the beef from longer suffering and sending it into the homes of the extremely poor, cut for eating. With this will ground up with the other preparations these cattle can thrive upon perfectly wholesome food and the best-fed meat can then go to the poorest as well as to the more wealthy.

Another purpose to which the cornstalk can be put, declared Prof. Gibbs, is the manufacture of sugar. Better, finer and cheaper sugar can be made from it, he claimed, than is made from the sugarcane of Louisiana. The speaker would say by declaring that when these facts became thoroughly known and realized and plants put into operation for the manufacture of the articles the entire crop of the country would be required to meet the demand and the farmer would receive at least \$2.50 per ton for cornstalks which he now is sometimes put to an expense to get rid of. He stated that \$10 per acre would be received by the farmer for his stalks, after he had already received about a similar price for the corn, thus actually doubling the value of the corn crop of the country.

In another column appears an advertisement of the Page Seed Co., Greene, N. Y. The proposition seems to be exceptionally liberal. It is especially so when you consider the fact that the packages offered are full size and are not, as might be supposed, mere samples. Page Seed Co. is a reputable concern and their catalogue contains much information of value to intending purchasers. They mail it free if addressed as above.

CONSERVATION OF MOISTURE.

Valuable Information on This All-Important Subject.

In order to produce paying crops, it is necessary that moisture should be conserved. The Cornell Station, in a very instructive bulletin, gives the following summary:

Owing to the unequal distribution and to the loss of nearly one-half of the rainfall by surface drainage, crops usually suffer from drought.

The first step toward conserving moisture is to put the soil in such a physical condition that it will be pervious to water, or afford a reservoir for it.

Water exists in the soil as free, capillary, or hygroscopic. The free water within 18 inches of the surface is injurious to the growth of cultivated plants. The capillary water is the direct source of their supply, and should be conserved by all possible means.

Capillary action of the soil depends upon the firmness of the particles and the closeness of their relation to each other. In coarse, loose, sandy or gravelly soils the action is weak; in fine, well compacted soils it is strong.

When the capillary interstices or pores in the soil are continuous from the moist under-soil to the surface, the moisture rises uniformly and passes off into the atmosphere by evaporation. If, however, these interstices or pores are made very much larger near the surface, the moisture is arrested in its upward movement, a result which is accomplished by light surface cultivation, which produces a "soil mulch." This mulch of loose soil answers much the same purpose as a board or carpet would in cutting off the direct connection with the atmosphere. As soon as the soil becomes baked or encrusted, the capillary connection with the atmosphere is renewed and another tillage is required to re-establish the soil mulch.

A large amount of water is necessary for the plant, as its food is in a very dilute solution, and water is also used in building plant tissue.

Moisture in the soil is necessary that nitrification and decomposition of organic matter may take place. Without it the action by which the roots are able to corrode the solid rock and set free plant food cannot take place.

The distribution of rainfall cannot be controlled by any known means. Dependence must be placed upon the conservation of soil moisture.

The means by which moisture can be conserved are: Judicious plowing and tillage, mulches, underdrainage, windbreaks, applications of lime, salt, etc., and adaptation of crop to the soil.

The absorbing or capillary power of soil depends upon the fineness of division of its particles.

The plow is a most valuable implement for pulverizing and fining the soil. Fall plowing is recommended for heavy clays, the surface to be left rough and unharrowed. Fall-plowed lands catch and hold the water.

Surface tillage should begin early in the Spring, as every day's delay after the soil is in fit condition means a loss of many tons of water.

The harrow is valuable as an implement with which to establish and maintain a surface mulch. Frequent harrowing of an old orchard will greatly lessen the evaporation from the surface.

When cultivators are used as conservers of moisture, many fine teeth are preferable to a few coarse teeth.

Ridge culture is calculated to promote evaporation. To conserve moisture, practice level culture and so reduce the area exposed.

The roller brings moisture to the surface by compressing the soil. On loose, sandy soils it is useful by compacting the particles. On clay soils use may prove injurious if followed by heavy rains. Where possible it is well to follow it with a smoothing-harrow to restore the mulch.

A surface mulch of leaves and decaying vegetable matter is nature's way of conserving moisture. It also adds humus to the soil, which is the great storehouse for nitrogen and moisture. An herbage mulch can rarely be used in farm areas, however.

Underdrains act beneficially in making soils porous above them and thus increasing their permeability; and in removing the free water and thus allowing the access of air, which is as necessary as moisture.

Lime, gypsum and salt are all used as conservers of moisture. An application of lime seems to have a beneficial effect on heavy clay and on light sand. It also acts favorably on marshy, sour lands.

Grasses and grains should be grown on clay and loamy soils, leaving sandy and gravelly lands for cultivated crops. The humus of tilled lands may be kept up by barn manures and by green manuring.

The space between the trees in orchards should be left free for tillage. A growing crop makes such a demand upon the supply of moisture that the trees may be seriously injured.

Determinations of soil moisture may be easily made by any one. The importance of this line of work is called to the attention of grangers, farmers' clubs and horticultural societies.

The importance of thorough tillage to conserve moisture cannot be made too emphatic. Deficiency in rainfall with intensified agriculture is preferable to abundant rains and neglect by the cultivator. The soil will respond in a large measure according to the treatment it receives. Neglect it and it will fail to bring forth liberal increase, but cultivate it intelligently and thoroughly and it will respond quickly.

Dobbins' Floating-Borax Soap is not an imitation. It is original. The only soap that floats, contains borax, and is 100 per cent. pure. It is worthy a trial. Every lady who tries it continues its use. Red wrapper.



(For the leisure hour of readers, old and young. All are invited to contribute original puzzles and send solutions to those published. Answers and names of solvers to this issue will appear in two months. An asterisk (*) after a definition signifies that the word is obsolete. Address letters for this department: "Puzzle Editor," THE AMERICAN FARMER, 1725 New York Ave., Washington, D. C.)

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